

THE IRON AGE

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Maintaining Histories of Castings

Form of Report to Keep Records of Analyses of Castings, of Foundry Working Conditions and of Service of Castings in Use

Very few jobbing foundries make anything like a systematic attempt to keep track of castings after they leave the foundry. Complete foundry records as to the mixture used and the special conditions that attend the drawing of any particular heat are also generally hard to obtain after any length of time has elapsed. To look up the record of a casting in foundry as ordinarily operated involves searching through a number of reports that are rarely ever kept in a systematic manner.

cinnati, Ohio. The one report is made up by three different departments and covers the record of a casting until it is discarded by the user.

The report is first numbered and dated by the foreman, who fills it out under the heads given of "Mixture," "Analysis of Material," and "Castings Made" with the exception of the actual analysis line that is filled in by the chemist after making an analysis of the cupola charge from which the castings are made. The foreman is able to

Form of Life Record of a Casting as Devised by H. M. Ramp, Modern Foundry Company, Cincinnati

The accompanying form of report was devised by H. M. Ramp, formerly superintendent of the United Iron Works Company, at Springfield, Mo., now holding the same position with the Modern Foundry Company, at Oakley, Cincinnati.

make up his computed analysis figures from those furnished by the purchasing department. Each car of pig iron or scrap is stored on the yard in a separate pile, that is tagged with the car number and name of shipper, and

knowing the average analyses of the different brands of pig iron, the superintendent is able to specify the approximate quantity of each kind for any special mixture.

Under the heading Castings Made, the kind of casting, as well as the name of purchaser is generally inserted, and under that of Foundry Record, the foreman notes whether the iron ran hot or cold, and also explains any large discrepancy, so far as he might be able to determine, between the computed and actual analyses.

The Field Record, one of the most important parts of this report, is kept by the office, and is filled out after the foreman has turned in the report, completed so far as the foundry end of it is concerned. In the column headed Size, either the size, or kind, of casting is entered, followed by name of customer and the date sold or shipped. The Record of service is made up principally from reports of the traveling salesmen, as well as those received direct from the customer. On every casting either the report number is cast, or the date, hence it is very easy to find the particular report blank and enter the complete record.

When there is any complaint regarding a defective casting, or when its field record shows it to be one extra good, the report as can be readily seen will show what kind of a mixture was used and under what special conditions the work may have been done. A perusal of records kept for a number of years past will frequently enable the foundryman to overcome many difficulties that would otherwise probably entail a lot of experimenting. Of course the report form may be easily changed to suit special conditions in any foundry.

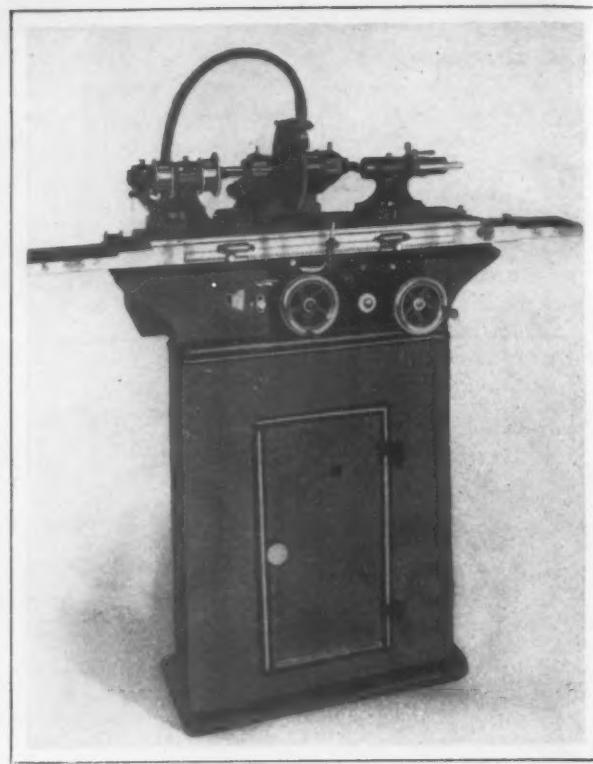


Fig. 1—The New No. 1 Universal Grinding Machine Built by the Modern Tool Company, Erie, Pa.

the table and the cross feed mechanism. Fig. 1 shows the machine, while details of the table and cross feed mechanisms are given in Figs. 2 and 3 respectively.

The overhead driving mechanism is designed to drive the wheel spindle, the work spindle and the table independently of each other, and means are provided for stopping the work to caliper or remove it. The sliding table is controlled in all its movements by the hand wheel *a*, Fig. 2, which is mounted on a sleeve. On its opposite end

The No. 1 Modern Grinder

A New Machine Tool Possessing Novel Cross and Table Feed Mechanisms

For small tool room work and the economical grinding of small parts in machine shops manufacturing light machines, the Modern Tool Company, Erie, Pa., has brought out a grinding machine of the full universal type. With this object in view the designer has endeavored to pro-

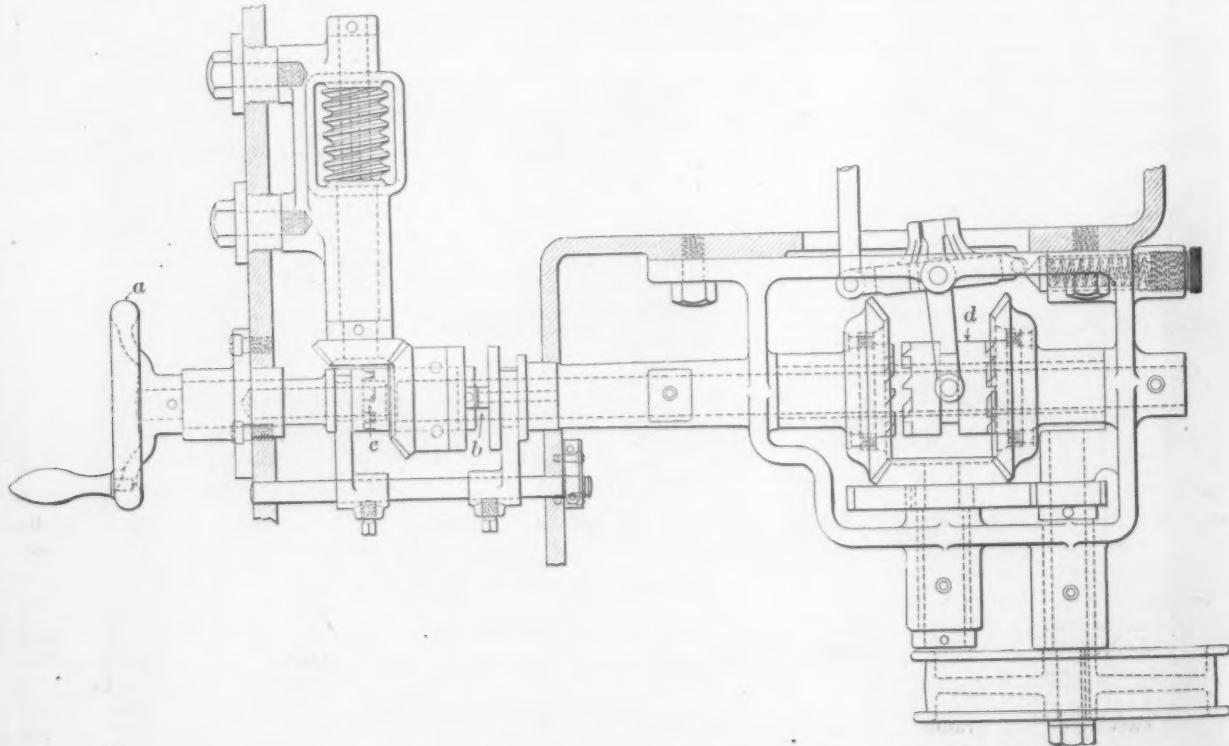


Fig. 2—The Table Feed Mechanism

duce a machine of rigid design and one possessing the same amount of power as the builder's present larger machines and capable of giving a high rate of production. Two of the special features from a mechanical standpoint are

the sleeve carries a clutch, *b*, which engages with the table driving clutch and applies the power to the table when the hand wheel is moved away from the bed of the machine. In this position the hand wheel remains motionless and dis-

engaged from the table feeding mechanism until the wheel is again moved toward the bed of the machine. In this direction it throws the feed off and the table can be moved by hand through the clutch *c*. The table reversing

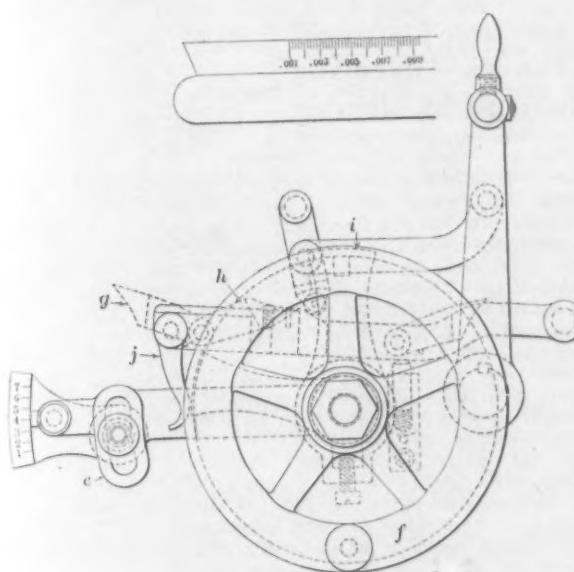


Fig. 3—Details of the Cross Feed

mechanism, which is shown at the right of Fig. 2, is an improved type of clutch motion which is said to be simple and positive in action, consists of a few parts and is not apt to get out of running order. Special emphasis is laid upon the fact that it is not possible to center the reversing clutch *d* and it will not stand in any but the working position and the points pass before the clutches are disengaged. This transmission is springless with the exception of the one used to make the action positive under all conditions and the troubles which are ordinarily encountered with spring clutches are said to have been eliminated. Another advantage claimed for this mechanism is that it will reverse the table regularly within a few thousandths of an inch, a feature of importance when work is being ground to shoulders.

The cross or grinding wheel feed, details of which are shown in Fig. 3, is of a novel design. It is so arranged that either the minimum or maximum feed can be applied by moving the hand lever *e* which is located on the front of the machine within easy reach of the operator. The minimum feed is 0.0001 in. and the maximum is 0.001 in., the intermediate positions shown on the feed level dial indicating 0.0001 in. each. These lines are shown at the left of the engraving. The cross feed hand wheel *f* is graduated on its beveled face to correspond to the teeth in the cross feed dial. These graduations are shown in the upper portion of this engraving and the arrangement enables the operator to see how much the wheel is removing at each feed. A cut out latch, *g*, enables the operator after roughing down to approximately the finished size to throw the feed off at either end of the table travel, thus reducing the feed one half to finish the work without stopping any part of the machine. When the cut-out latch is in the position *g*, the feed is thrown off at both ends of the table travel, while when it is in the position *h*, the table is fed in one direction only. This arrangement of having the wheel feed at either end of the table travel is an important feature and one that saves time in grinding internal work, slender rods, etc. If desired the feed can be stopped at any predetermined point by the lever *i* which lifts the pawl *j* out of engagement.

The swivel table is graduated to grind tapers having a maximum of 6 deg. and $2\frac{1}{2}$ in. per foot. The head stock is graduated at 90 deg. on one side of the center and 15 deg. on the other, and the wheel spindle is fitted with an end wheel for angle grinding on the face plate or in a chuck.

The following table gives the principal dimensions and specifications of the grinder:

Swing, in.....	5
Distance between centers, in.....	16
Swing without water guards, in.....	7 $\frac{1}{4}$
Diameter of grinding wheel, in.....	8
Minimum face width of grinding wheel, in.....	$\frac{3}{4}$
Maximum face width of grinding wheel, in.....	$\frac{3}{4}$
Diameter of end wheel, in.....	6
Face width of end wheel, in.....	$\frac{1}{2}$
Net weight of machine, lb.....	1,200

Although the machine is regularly mounted on a cast-iron base as shown, if so ordered it can be furnished for mounting on an ordinary shop bench.

Fire Losses in the United States

BY SIDNEY G. KOON.

The accompanying chart shows the progress historically of fire losses, buildings and contents, in the United States during the past 36 years. In order to smooth over inequalities due to extreme losses one year and considerably lower ones the next, the chart has been figured out on the basis of averages for six years, and is so plotted. There are five curves presented, of which the one depicting the total fire losses, in tens of millions of dollars, shows the greatest rate of increase at practically every point across the chart. It is growing faster than the national wealth, and very much faster than the population. Both of these facts are seen in the two upper curves showing, respectively, the fire loss per capita and the fire loss per thousand dollars of national wealth, each of which is now well above the two-dollar mark.

During the 36 years covered by the chart the fire loss in the United States has amounted to the stupendous figure

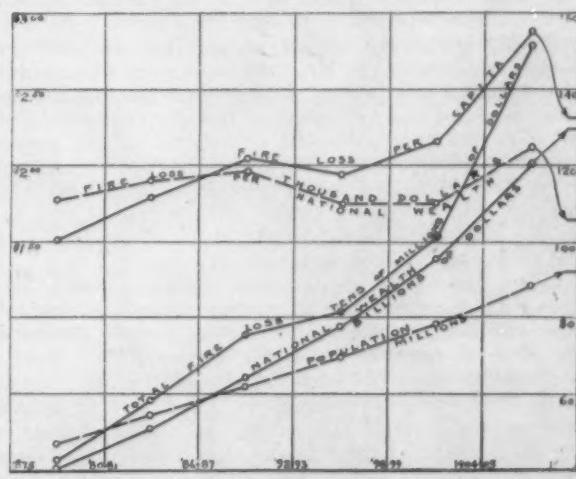


Chart of Fire Losses for 36 Years

of \$5,120,622,540. This is more than 7 per cent. on the average value of national wealth over this period of time. As a matter of fact, the present annual gain in wealth, which is about \$4,600,000,000, represents only the capital at 5 per cent. of our annual fire loss of \$230,000,000 per year.

When it is known that over 95 per cent. of all fires in buildings equipped with automatic sprinklers are either completely extinguished by the sprinklers, or held in check for the firemen to finish (being prevented from spreading by the flow of water from the sprinklers), the solution of the problem is seen to be at hand. A sprinklered department store stopped the Baltimore fire; if the building in which this fire started had been properly equipped, there would have been no conflagration to stop.

The Coe Brass Mfg. Company's mills at Ansonia, Conn., are now being operated as a branch of the American Brass Company, and are known as the Coe Brass Ansonia Branch of the American Brass Company. There will be no change whatever in the personnel of the management of this plant. It will continue to handle its own correspondence, do its own billing and collecting, and the requirements of customers will be looked after in the same efficient manner and by the same people as heretofore. The active operating officers of the Coe Brass Ansonia Branch are Chas. F. Brooker, president; A. S. Brown, assistant manager.

S. DIESCHER & SONS.
Mechanical and Civil Engineers,
PITTSBURGH, PA.

A Testimonial to Charles M. Schwab

Interesting Comment on Iron and Steel Developments at a Dinner Given by the Manufacturers' Club of Philadelphia

A notable gathering of men identified with iron, steel, financial and general business interests of national, state and local prominence, numbering over 400, participated in a dinner given at Philadelphia Thursday evening, January 11, in honor of Charles M. Schwab, president of the Bethlehem Steel Company. The testimonial was organized by the iron and steel section of the Manufacturers' Club of Philadelphia, and the function was held at the Bellevue-Stratford Hotel, the grand ballroom of which was lavishly decorated for the occasion. Many ladies occupied the balcony boxes of the ballroom and added to the interest and brilliancy of the occasion. Preceding the banquet Nathan T. Folwell, president of the Manufacturers' Club; James Mapes Dodge, John Birkinbine and James B. Bonner attended the guest of honor at a formal reception held in a room adjoining the grand ballroom.

After the dinner Nathan T. Folwell introduced as toastmaster James Mapes Dodge, who performed the duties of that office most entertainingly. The first speaker was Charles Heber Clark, one of the charter members of the Manufacturers' Club and for ten years its secretary, who responded to the toast, "The Manufacturers' Club." He referred to Mr. Schwab as a public benefactor of the highest rank, a man of creative genius, who had provided work for many thousands. The Manufacturers' Club, he said, had been influential in national affairs, particularly in tariff legislation. Its growth has been remarkable, as is best illustrated by its practically completed plans for the new club house, which will be erected this year on the site now occupied by the club and designed to be the finest club building in the world.

Hon. Boies Penrose, responding to the toast, "Our Country," spoke of the extraordinary influence of the iron and steel industry, which in the present generation had done so much to make this country great. Were it not for the energy of such creative men as Mr. Schwab many of our natural resources might still be in the ground. The speaker credited Mr. Schwab with a large share of the development of the iron and steel industry in Western Pennsylvania, and called attention to the rapidly growing importance of the industry with which he is now identified in Eastern Pennsylvania.

Mr. Schwab's Remarks

The toastmaster then introduced the guest of the evening, who made a most interesting address, replete with reminiscences and happy turns. He dealt at some length with questions of immediate interest to the steel trade, relating to its growth and regulation. He said in part:

JOHN FRITZ AND CAPTAIN JONES.

When I attended your dinner to John Fritz in November, 1910, it was my pleasure to pronounce a few words of eulogy upon that grand old ironmaster, a man whom I have known intimately for 30 years, the dearest friend of my great friend and patron of whom Senator Penrose spoke, Capt. "Bill" Jones. I want to say one word here with reference to these two men. We were speaking of the conservation of our natural resources in this country. But how many of us have ever stopped to think what these two men have done in our great industry to make it prosperous and profitable? Some 30 years ago Captain Jones invented the metal mixer and John Fritz the three-high rolling mill, the two great appliances in steelmaking without which no steel works could exist. A very moderate estimate of what their value is to the industry would be at least \$5 on every ton of steel made; and with the \$25,000,000 tons made in the United States alone, you can see that these two ideas from these two great men, at practically the same time, make a saving to the manufacturers of this country today of \$125,000,000 annually. These are the men who deserve real praise for our great industry.

My old master, Captain Jones, was one of nature's noblemen, a great genius mechanically, unskilled and un-

lettered in the scientific part of the steel business; and how well I recall some of the incidents of that day compared with our practice today. For example, I remember very well when the Pennsylvania Railroad Company for the first time specified in its order for rails that they should be of certain chemical composition. That alarmed Captain Jones. He had not heard much of carbon, sulphur, manganese, etc., and he employed a chemist. The rails were ordered to be of 0.35 to 0.40 carbon, and sometimes they were marked 0.15 and sometimes 0.55. "You know that is wrong," Captain Jones would say; "you know that ought to be 0.35." And then he would scratch it out and mark it 0.35.

And then I remember on another occasion these analyses bothered the captain a great deal, and he said: "This — chemistry is going to spoil the steel business yet." It was through many experiences of this kind that this great business was built up, and with what astonishing rapidity.

SURPRISING DEVELOPMENT.

I see seated among us this evening a very dear friend of mine, who has made great strides in the industry of Pennsylvania—Charles T. Schoen. It was along about 1896 or 1897 that Mr. Schoen built the first steel cars that were built in the United States and put them on the Bessemer Railroad. Stop to think what that means at this time, 16 years afterward. In one recent year the steel car industry consumed about 3,000,000 tons of steel—that one single development.

I want to relate another incident that I told Mr. Carnegie the other day. I wrote him in 1887, when we designed a rail mill at Braddock, telling him what we were going to do and enthusiastically describing the mill as being able when completed to roll 1,000 tons of steel rails per day. Mr. Carnegie wrote back: "I see no objections to the amount of money you want to spend, but I want to exact one promise from you, and that is that you will never tell anybody that we were foolish enough to suppose that this country would ever require a mill to make 1,000 tons of rail per day." Now, think of our making 12,000 to 15,000 tons of rail a day, and this development coming in that short space of time!

In the year 1880 this whole country consumed less than 1,000,000 tons of steel; in 1890, at the rate of 5,000,000 tons; in 1900, about 13,000,000 tons, and last year about 23,000,000 tons, and we have been up to 26,000,000 tons of steel. Nor do I think that that is by any means the ultimate development of the business. I think we are destined to go forward and upward. As I have many times predicted, I look to see within my lifetime—within the next 10, 12 or 15 years—this country consuming 40,000,000 tons of steel annually. And when it does, the rest of you may stand from under.

WHAT CONSOLIDATIONS HAVE DONE.

It was farthest from my thought to make any statement tonight with reference to what ought to be the laws of this country as applied to great industries like steel. But I do want to say a few things as to what I think is necessary to give the United States the pre-eminence it deserves in the manufacture of iron and steel or what is necessary to give us the preponderance of the business of the world. The United States Steel Corporation was organized for the ultimate purpose of effecting such economies as would make profitable its great investment. The fact that they are able to run one mill on one product, to distribute product from the nearest mill, to do everything on the huge scale on which they do it, has made a cheapening in the cost of producing steel that can be accomplished in no other manner. And I say that any legislation that will destroy the most economical possibilities of manufacture is legislation that is going to hurt and hinder industry. There has not been a single year since 1901, the year in which the Steel Corporation was formed, that the average earnings of the employees of the corporation have not increased. I expected Mr. Farrell here this evening. I have a telegram from him saying he was detained. But Mr. Farrell, the president of the corporation, when he gave me these figures yesterday, said that if the Steel Corporation paid today the same rates of wages as it paid in the year 1901

it would have had to pay for the year 1911 about \$31,000,000 less in wages to its employees than it did pay. I want you to think what that means. If they had paid the same in 1911 they would have saved \$31,000,000.

What is the result of this great aggregation? It has enabled manufacturers to pay better wages, and in times of depression like the present to avoid the reduction of wages. Gentlemen, there has not to my knowledge ever been a period in which steel has generally sold as low as today. There has never been a time in the industry in which wages of workingmen have been as high as they are today. Why is that? It is because the manufacturer has been able to take advantage of the things that great consolidations of business will give him to make his profits and to have his margin of cost rather than take it from the wages. There is nothing that enters into the cost of any manufactured article but labor. If we want to reduce costs what are we going to do? What is there that you can make less? There is nothing but labor in the steel industry. About 35 per cent. of the money paid out is labor, 30 per cent. of it is freight. But analyze freight back to its beginning—it is labor. You buy supplies and analyze them back to their beginning—it is nothing but labor. Therefore, there is no way in which we can reduce costs if forced to do so than by reduction of labor, not only in the steel mill, but on railroads, and in the operations of everybody that serves the steel industry.

A RETURN TO INDIVIDUALISM WOULD BE COSTLY.

If these great companies are forced to individualism, and in such a way that they cannot operate as they do today, costs are going to increase; and if they do increase, and we are obliged to meet competition from abroad and are not properly protected by tariff, there is but one conclusion after that, and that is that labor must suffer the consequences. There is no other way in which it can be done. The United States Steel Corporation has not only benefited the people employed by it, but it has benefited the industry and the independent steel manufacturers in every section of the country. The independent steel manufacturers have reaped practically as good results from the formation as the Steel Corporation itself. One of the chief things that enabled the corporation to make its costs lower was its ability to compare the costs of one works with the other. I have even proposed, as Mr. Felton and some of my friends well know, that independent steel companies get together and compare every item of cost and every advantage as between themselves just as the Steel Corporation does between its various works. The day when mystery is made of costs has passed away. I am perfectly willing to give any manufacturer my costs, if he gives me his, because good is sure to result from such comparison. I do hope, therefore, that whatever the future may hold for us, an excited public may see that no great fortunes have been made through illegal combinations and will change its point of view and come to the realization of the great advantages that result from large corporations. I believe that many evils have crept into such organizations, and I believe such evils should be regulated and controlled. I remember very well with what fear the railroads regarded the Interstate Commerce Commission to regulate their affairs. Never anything better happened to the railroads than the Interstate Commerce Commission; and I believe that such a commission should be organized to regulate the affairs of great industrial establishments, if necessary. And while we may find it a hardship in some instances, the ultimate outcome of it must be to the advantage of all concerned.

EASTERN PENNSYLVANIA IN THE STEEL INDUSTRY.

The Senator spoke of the fact that I had come to Pennsylvania for the development of the industries which were in my mind. Why should I not do so? What State in the Union, what country in the world, occupies the pre-eminence of the great State that the Senator represents. Half, speaking in round numbers, of all the pig iron made in the United States was made in the State of Pennsylvania this last year. Of \$250,000,000 worth of steel exported 85 per cent. was made in the State of Pennsylvania. We read of the great works at Chicago called the Gary steel works, but how many people have stopped to think that the United States Steel Corporation have added more to its capacity in the city of Pittsburgh than the entire Gary works has added; and in so doing the Steel Corporation recognized the value of Pennsylvania as a great manufacturing center.

I happened to look at the figures this afternoon as to what our company in Eastern Pennsylvania had done in the past 10 years, and you will be a little surprised when I tell you that our business in the last 10 years has increased a little more than 500 per cent. What does that mean? It means that the eastern part of Pennsylvania, to my mind, has only entered upon the period of greater

prominence in iron and steel manufacture to which its location and its position entitle it. The iron ores in the west are segregated on the Lake Superior ranges. They are discovering no new ranges, and ore is being depleted at the rate of 50,000,000 tons per year, while the eastern part of Pennsylvania has access to such untold quantities of ore as will supply the needs of its iron and steel industry for hundreds of years to come. Therefore, while we may probably not live to see it, I make the prediction that the East has only started, Eastern Pennsylvania has only started upon a career of successful manufacture that will make it the greatest iron and steel center in the world.

Business Methods in Government

Hon. Rudolph Blankenburg, mayor of Philadelphia, responded to the toast, "The City of Philadelphia." Mr. Blankenburg made an interesting address and announced that, while he was recently elected mayor on a reform platform, he was a Republican in national politics and a strong believer in the protective tariff. He said that it was his firm belief that the system and methods used in the business world should also be applied in the management of the affairs of the municipality.

Hon. John K. Tener, Governor of Pennsylvania, was then introduced and paid a tribute to Mr. Schwab, whom he had known since boyhood days. He had followed his career in and about the mills which he had created in western Pennsylvania, his further achievements in the eastern part of the State and the many successes during his connection with the iron and steel trade. The Governor spoke briefly of the resources of the Commonwealth of Pennsylvania, both from the industrial and agricultural standpoint.

The Eastern Iron and Steel Situation

The closing address of the evening was by John Birkinbine, who responded to the toast, "The Eastern Iron and Steel Situation." Mr. Birkinbine said, among other things:

The tribute to Mr. Schwab has a twofold significance, and he may well be gratified at the recognition of either by representatives of the manufacturing interests of Philadelphia and Eastern Pennsylvania and by those from a distance who have joined in the function. We unite in honoring one who, starting near the base of the ladder leading to industrial prominence, is acclaimed as having attained the top; giving another demonstration that the American boy's best asset is his own capabilities industriously applied. It has been my privilege to know the guest of the evening when he was apparently nearer the ladder's foot than the summit, and to note that on whatever rung he stood one foot was seeking the next above, while his hand reached still higher. A second feature of this gathering expresses to Mr. Schwab the opinion that his efforts in advancing the iron and steel industry of the eastern portion of the country entitle him to be classed as a "pacemaker."

WHAT PENNSYLVANIA HAS DONE IN IRON AND STEEL

As a loyal Pennsylvanian I rejoice in the knowledge that the value of the State's mineral products and their manufactures represent annually practically one-third of those of the United States and exceed that of all the States and Territories west of the Mississippi River, including Alaska, and is four times the amount of gold and silver won in the country. No other State—in fact, no nation except Great Britain and Germany—mines as much coal as Pennsylvania; for each working day an average of about three-quarter million tons is won.

I am glad that the State, in spite of the growth of industries elsewhere, supplies over 40 per cent. of the country's output of pig iron, and over one-half of its steel products, and that its blast furnaces have an average output about one-third greater than those in the balance of the country. Notwithstanding the phenomenal expansion of population and industries in newer sections of the country, the nation has in the past decade advanced but little more in proportionate population than Pennsylvania, and our State has more than held its own in iron production and steel manufacture.

Most of the increased production is to be credited to the Pittsburgh district, where our guest followed iron metallurgy through various processes, and he was cognizant of the details which made possible remarkable outputs. While the quantity of pig iron made in Pennsylvania east of the Allegheny mountains has not decreased in a decade, the relative importance to the total for the country of this portion of our State and of neighboring States has suggested to some a retrograde movement. We

credit Mr. Schwab as a "pacemaker" in disproving this latter view, for he with others recognized the resources and possibilities of the East, which have been overshadowed by the enormous development of the Lake Superior iron mines and the utilization of the mineral won from them.

What the Bethlehem plant is to be you learn from Mr. Schwab and from others, but much of its success will be based upon utilization of known resources, application of modern equipment and putting to useful purpose that which is wasted. This assembly recognizes the progressive spirit and expresses a desire that the fullest success may follow the efforts made.

Were I to prophesy other iron and steel industries in the near future close to the Atlantic seaboard I might be considered visionary, but there appears good reason to anticipate such results.

THE IRON ORES OF THE EAST.

Many of those present are familiar with the iron ores formerly won to supply the Eastern iron industries, and know of dormant or abandoned properties, but can indicate but few deposits as exhausted. Improved mining methods and beneficiating processes, the prospect of obtaining ores of excellent character at competitive costs with others brought from a distance, suggest revival of activity at many mines. The reserves of but few Eastern ore properties have been investigated, but when this has been done expectations have generally been exceeded.

The Lake Champlain Adirondack region of New York supplies 1,000,000 tons of excellent iron ore per year, one-half of which is concentrates, a quantity which can be multiplied as occasion demands; and in that section alone iron ore deposits have been studied which show reserves to be measured in hundreds of millions of tons.

Liberal expenditures at Cornwall and Lebanon in our own State were determined after careful investigation, to be warranted by the reserves.

A careful study of the iron ore reserves demonstrates that their exhaustion in the sections considered is no more threatening than in the country as a whole, and anxiety for the future on this score is to my mind unnecessary.

AIDS TO THE EASTERN REVIVAL.

Ovens producing coke at the works where the by-products can be recovered and waste gas or heat applied, mechanical equipment for handling materials and products in large quantity at minimum cost, abundance of intelligent labor available, transportation by rail and water bringing supplies to or taking manufactures from the plants, cities providing docks to accommodate large vessels, with river channels and canals deepened, powerful locomotives and large cars, have improved the transportation problem. Electricity employed for power, light and metallurgical purposes, the production of ferric alloys with elements formerly under the ban, are also matters which tend to a revival of the industry in the eastern United States.

To follow the methods formerly used where hand labor predominated, where materials or products are treated in small units, where sources of power and heat go to waste, would be suicidal to any new enterprise. But those most familiar with local conditions are in position to verify the features above briefly indicated and to add others thereto.

It may seem ungenerous to point out to the guest of the evening possible competitors in the field which he and others occupy, but he probably realizes fully as well as any of us that these may come, and may be depended upon to keep his works abreast of any which may arise in the future. We therefore greet our guest not merely because of the ability which he has developed as a man, but because by his initiative in rehabilitating and enlarging a plant with an honored name and a reputation for product, he has pointed the way towards an enlarged iron and steel industry in the eastern portion of the United States.

Committees and Participants

The committee representing the iron and steel section of the Manufacturers' Club included Henry D. Heller, Thomas Iron Company, chairman; John Birkinbine; James B. Bonner, Carnegie Steel Company; Thomas Devlin, Thomas Devlin Mfg. Company; Jacob S. Disston, Henry Disston & Sons' Company; Alba B. Johnson, Baldwin Locomotive Works; A. D. Mixsell, Bethlehem Steel Company; J. N. Mohr, J. J. Mohr & Co.; Howard R. Sheppard, Isaac A. Sheppard & Co.; Warren Webster, Warren Webster & Co., and James M. Nagle, secretary.

The general committee in charge of the banquet consisted of Nathan T. Folwell, chairman; Alfred E. Burk, Henry D. Heller, Elmer P. Weisel, E. E. Brown, Walter F. Ballinger, T. Darl Buckwalter, John Fisler, L. N. D. Williams, J. Clifton Buck, T. James Fernley, N. T. Folwell, 2d.; H. W. Castor, Henry D. Hughes, Charles R. Hall and A. A. Miller.

Among those present were the following:

Thos. F. Armstrong, Thos. H. Ashton, Eugene M. Applebaugh, Edward H. Burr, John Birkinbine, Dimmer Beeber, Alfred E. Burk, John H. Bromley, Robt. E. Brooke, W. H. S. Bateman, L. J. Bordo, T. Darl Buckwalter, C. A. Buck, A. Benziger, J. Clifton Buck, A. C. Buzby, Chas. Bond, Walter F. Ballinger, James B. Bonner, L. D. Berger, E. E. Brown, W. W. Blackburn, Cyrus Borgner, Lewis Burk, F. T. Chandler, S. H. Chauvenet, Geo. Fritz Chandler, W. G. Cox, Edward B. Cooke, Chas. Heber Clark, John J. Caine, T. I. Crane.

James Mapes Dodge, Thomas Devlin, J. E. Dodson, Agnew T. Dice, James M. Degnan, Geo. Derby, F. D. Dimmick, A. J. Hull, C. A. Daniel, Alfred Dryer.

J. A. Eberts, Thomas M. Eynon, J. S. Elverson, T. James Fernley, E. C. Felton, E. T. Fraime, Milton Flory, John Fisler, Geo. E. Flory, Lewis W. Francis, B. F. Fackenthal, G. C. Fogwell, A. I. Findley.

Alex. Graham, Joseph Grundy, James Gayley, J. R. Goehring, M. R. Gano, E. G. Grace, Paul B. Huyett, A. F. Huston, Harry W. Hand, Chas. R. Hall, Wm. S. Harvey, Charles C. Harrison, Herman L. Hohlfeld, W. S. Hollowell, Henry D. Hughes, H. D. Heller, Wm. J. Heller, John Hughes.

Jonathan R. Jones, Henry L. James, B. H. Jones, Alba B. Johnson, Archibald Johnson, W. B. Kennedy.

James Lord, G. H. Leaf, Wm. O. Lentz, James M. McCunn, Hugh McCaffrey, Geo. L. Markland, Jr., A. A. Miller, W. B. Myers, A. D. Mixsell, James N. Mohr, J. Jacob Mohr, W. S. Mallory, Harrison S. Morris, Howard C. Matlack, Alfred Marshall, F. Warren Marshall.

L. F. Nagle, C. H. Newcomb, James M. Nagle, John F. O'Brien, Col. C. T. O'Neill, George Ormond, John D. Ormond.

Antonio C. Pessano, Leonard Peckitt, Grantley P. Postiles, Wm. Pedrick, Jr., T. J. Price, John J. Page.

F. A. Riehle, Henry P. Rees, James Rawle, David Reeves, G. W. Riegel, C. S. Robinson, Chas. F. Rand, David Reeves.

Abraham S. Schropp, Chas. T. Schoen, Howard R. Sheppard, C. W. Summerfield, C. J. Stark, A. A. Stevenson, H. J. Seaman, H. S. Stebbins, Harry Snyder, F. A. Shick, J. G. Schmidtapp, Leslie M. Shaw, Hon. Wm. S. Sproul, J. S. Stillman, J. H. Schwacke.

Wm. L. Todd, Edwin Thomas, H. Dale Thomas, David Thomas, W. M. Tobias, Harry C. Trexler.

C. Von Philp.

Howard Weiss, Warren Webster, Walter Wood, A. Spencer Webster, Edw. H. Worth, Geo. F. Worth, I. H. Weaver, Philip E. Wright, W. P. Worth, Warren Wilbur, J. H. Ward, E. H. Williams, J. R. Wilson.

Joseph H. Zerby.

The New England Foundrymen's Association

The sixteenth annual meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, Mass., on January 10, with President H. E. Wetherbee in the chair. A report was received from the committee appointed at the December meeting to consider placing before the railroads the question of a reduction in freight rates on pig iron from the Birmingham district, particularly during such time as the present low prices are obtained, the feeling being that the present rates are too high in comparison. The report was accepted as progressive and the committee was instructed to co-operate further with the associations interested in this movement. Officers for the year were elected as follows:

President, Charles L. Newcomb, Deane Steam Pump Company, Holyoke, Mass.; vice-presidents, Robert C. Bird, Broadway Iron Foundry, Cambridge, Mass.; treasurer, George H. Lincoln, G. H. Lincoln & Co., South Boston, Mass.; secretary, Fred F. Stockwell, Barbour-Stockwell Company, Cambridge, Mass. Executive Committee—Charles L. Nutter, Old Colony Foundry Company, East Bridgewater, Mass.; Charles A. Reed, Hickman, Williams & Co., Boston, Mass.; J. C. Hosford, Magee Furnace Company, Chelsea, Mass.; D. K. Bartlett, Builders Iron Foundry, Providence, R. I.; A. L. Clark, American Brake Shoe & Foundry Company, Norwood, Mass.

The Nicholson Sand & Supply Company, Providence, R. I., was elected to membership. The report of the secretary showed the membership of the association to be 130 houses. The treasurer reported a large balance on hand and all bills paid.

The banquet in the evening was attended by 125 members and guests. H. E. Wetherbee presided over the post-prandial exercises, extending cordial greetings to the guests. He presented Charles L. Newcomb, the newly elected president, as toastmaster. The principal speakers were Rev. John S. Lyon and Dr. P. T. O'Reilly, both of Holyoke. The party was also entertained by vocal and instrumental music furnished by professionals. A unanimous vote of thanks was extended to the committee on arrangements, Messrs. Carpenter, Reed and Nutter, for the delightful programme provided.

The Goldschmidt Detinning Company's new plant, at East Chicago, Ind., is nearing completion and will be operating in a short time, producing pig tin. Charles Lindmueller is in charge.

Panama Canal Electric Locomotives

The officials of the Isthmian Canal Commission have awarded a contract to the General Electric Company for one locomotive as a test unit under the alternative A bid at a total price for one machine of \$24,951. This is to be the first of 40 electric locomotives to be used to tow ships through the Panama Canal locks. They will move along the lock walls on a rack track while towing and by friction when running light. The machine consists of two tractors, with a steel drum or windlass on a truck. Power will be taken from a third rail.

Four locomotives will be used on each ship, two in front on each wall of the lock and two behind. Hawsers from each locomotive to the ship will hold the ship steady and in course. The rear locomotives will not be under power, but will be towed themselves by hawsers running to the ship.

The specimen locomotive will be built of carbon steel. The General Electric Company submitted 10 bids on these locomotives. The remaining 39 to be used would, under the bid of the company, cost approximately \$456,300. Vanadium steel locomotives would have cost, approximately, \$510,472. The purchase of one locomotive may not be followed for the remaining 39, after a test has been made, as the option is reserved by the canal commission to take other locomotives if found desirable.

The Empire Gear & Mfg. Company

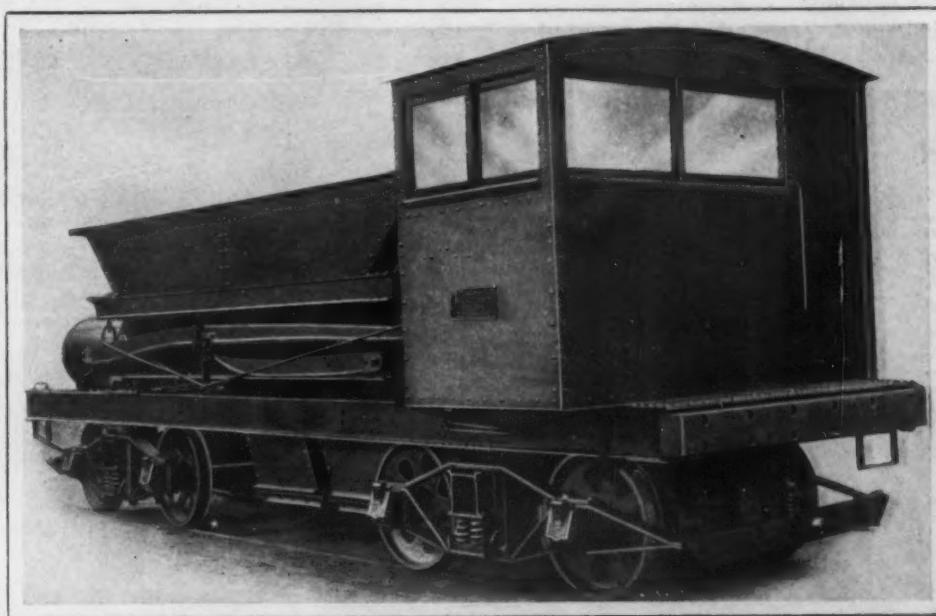
The Empire Gear & Mfg. Company, Indianapolis, Ind., has been formed for the purpose of doing general machine shop work, but making a specialty of the building of motors, transmissions, rear systems and other mechanical automobile parts. It has already secured such a standing for first-class work that it has been called on to furnish estimates on the more important parts of motor cars by some of the best automobile manufacturers in the country. The officers and directors are all practical men. Frank S. Clark, president, was formerly an engineer officer in the United States army and electrical engineer for the Big Four Railroad. Charles H. Hurd, vice-president, is general superintendent of the Indianapolis Water Company and was formerly professor of mechanical engineering in the University of Illinois. Howard M. Talbott, secretary, has not only been connected with the automobile business since automobiles were first made, but is a practical mechanic as well. Albert H. Off, treasurer, is of the firm of Christian Off & Co., Indianapolis, manufacturers of sheet metal goods and builders of fenders and hoods. Wesley Haefler, superintendent, was connected with the Dean Brothers Steam Pump Works for 16 years and has been with the Premier Motor Car Company since the building of its first car.

The R. D. Cole Mfg. Company, Newnan, Ga., states that the daily newspapers exaggerated its recent fire. There was only about a \$12,000 loss, and, with the exception of two of the cranes, none of the machinery was injured. The company is now running full time and with full force. It manufactures towers and tanks, standpipes, engines, boilers, corn mills, saw mills, sash and doors.

The Indiana Railroad Commission is to make an inquiry into the quality of steel rails. It has called a conference of steel rail manufacturers and railroad officials for February 8.

A New Bottom Dump Scale Car

Several new features have been embodied in the design of a new bottom dump scale car which has been recently built by the Atlas Car & Mfg. Company, Cleveland, Ohio, for the Youngstown Sheet & Tube Company. Although designed especially for handling coal, the car, which has a capacity of 10 tons, can also be used for handling ore.



A New Bottom Dump Scale Car for Handling Coal Built by the Atlas Car & Mfg. Company, Cleveland, Ohio

One of the special features of the car is the division of the hopper into two compartments.

Heavy steel construction is employed throughout the car and chilled wheels of the street railway type are used. The hopper is suspended from the steel frame by springs that relieve the Fairbanks scales with which the car is equipped from jarring. The hopper is divided into two compartments so that when desired the load can be discharged into several bins. At the bottom of each hopper is a door which is operated either by compressed air or by hand. Levers in the cab control the opening and the closing of the doors and this operation can be performed either simultaneously or separately on both doors. Compressed air for the door opening mechanism and also for the air brakes is supplied by an electrically-driven air compressor. In addition to the air brakes the car is equipped with hand brakes. The cab extends over the platform at one side which enables the operator to have a clear view of the track unobstructed by the hopper.

The following table gives the principal dimensions and specifications of the car:

Over-all length, ft.....	29
Width, ft.....	9
Height from rail to top of cab, ft.....	10
Capacity, lb.....	20,000
Capacity, cu. ft.....	400
Diameter of wheels, in.....	33
Gauge of track, in.....	56½

The electrical equipment of the car was furnished by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. The car is propelled by two No. 12 A 30-h.p., 250-volt, direct-current motors. The current for these motors is supplied through an overhead trolley which is not shown in the engraving.

The Newport Rolling Mill Company, Newport, Ky., announces the appointment of Theodore Geissmann & Co., Inc., Commercial National Bank Building, Chicago, Ill., as its authorized district sales agents for the sale of its galvanized sheets, blue annealed sheets and one-pass cold-rolled box annealed open-hearth steel sheets, as well as its full line of roofing materials. The Newport Company operates its own open-hearth steel plant, and is thus in position to guarantee a uniformity of product as well as dependable service.

Prevention of Industrial Accidents

The Work of the American Museum of Safety—Character of Safeguards Now Being Used for the Protection of Employees

The American Museum of Safety, 29 West Thirty-ninth street, New York, is issuing a series of "Manuals of Safety," which are for sale at 25 cents per copy. The

number. But there will always remain fatalities due to what may be called the inherent risks of industry. The fact must be faced when dealing with all phases of the subject. The responsibility for preventable accidents lies either with the employer or with the workman; and both are usually the sufferers to a varying degree.

The point should be emphasized that in industrial pursuits the public at large is rarely a direct sufferer, as it is in accidents occurring on lines of transportation, and the police powers of the state must not be so directly invoked. The community is affected indirectly, since it is often burdened with the care of the crippled or with the maintenance of the families of the victims. Aside from this responsibility, from which the community should be relieved, the state may be held to be charged with the duty of protecting the weak and of seeing that justice is done. The weight of responsibility, however, rests with both the employer and the workman, and no sentimental considerations should be allowed to befog the fact that both of the parties in a direct interest have very definite and very urgent duties.

THE EMPLOYER'S DUTY

The employer should exhaust every reasonable means to safeguard machinery and plant, even at the sacrifice, in urgent cases, of some productive capacity. The technical staff should give persistent study to the improvement of safety devices, in the light of the teachings of daily practice. The whole organization must be animated by the desire to drive home warnings of danger and participate in a campaign of education. There must be a close study of all accidents, with a view to drawing from them the lesson of future prevention. It must be recognized clearly that negligence in providing safety devices, neglect to warn or to teach, brings with it the payment of adequate compensations.

THE WORKMAN'S DUTY

A considerable percentage of accidents is always due to the negligence, recklessness and disregard of orders

latest addition to this series, on "Yard Practice, Walks and Railings," has an introduction by Charles Kirchhoff, chairman of the iron and steel section of the museum, which is as follows:

Mr. Kirchhoff's Views on Industrial Accidents

There is a general consensus of opinion that in this country, until recently, the sufferings and losses due to accidents in industrial pursuits have been excessive, and that a very large share of what relief has been offered voluntarily, or has been secured through process of law, has been dissipated or diverted into wrong channels. General indifference has given way to urgent demands for reform, extremists on one side facing the problems involved in the cold-blooded spirit of its effect upon profits, while enthusiasts on the other side urge methods which defy all sense of justice and ignore lurking dangers.

The movement for reform has as usual been characterized by violent, exaggerated statements, tainted with ignorance and prejudice, sometimes with malice. They have not been met by the protests they merit, even by those who have the cause at heart, because of the feeling that sensational agitation is needed to overcome indifference.

A JUST DISTRIBUTION OF RESPONSIBILITIES

But efforts for a lasting betterment of conditions in industrial pursuits must rest on the broad foundation of a just distribution of responsibilities. Even a casual investigation of accidents shows that a large proportion of them is due to causes which could not have been foreseen, or to an extraordinary coincidence of events. There is, of course, the reasonable expectation that progress in technical pursuits and persistent study of casualties will lessen

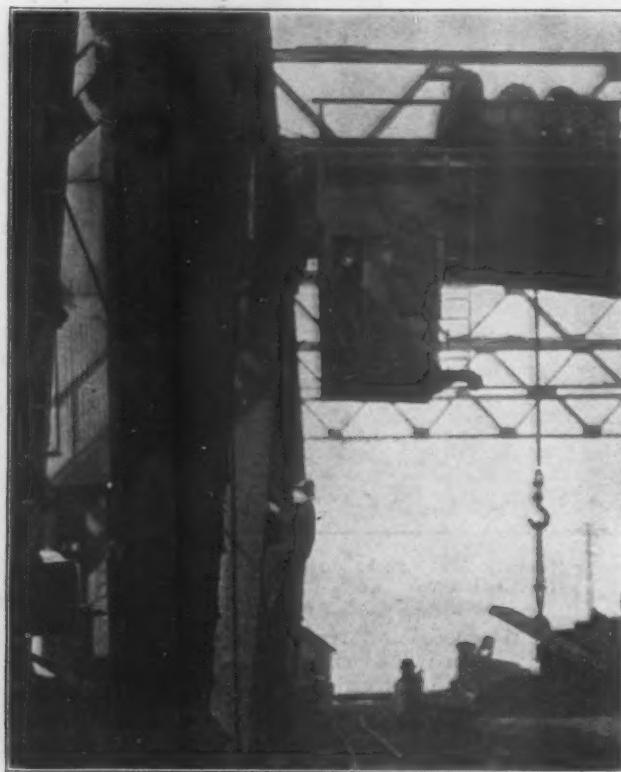


Fig. 1—The Old Way to Reach a Crane Cab



Fig. 2—The Modern Way to Reach a Crane Cab



Fig. 3—A Protection for Workmen's Toes

on the part of the workmen. Little sympathy need be wasted on the man who has thus imperilled his own life or limb, although it is a serious problem how to provide for those dependent upon him. But it is a crime which cannot be too emphatically condemned, when a workman endangers his fellow-workmen. It is the duty of every man, not alone to use his best endeavors to prevent accidents, by utilizing safety devices himself, and watching that they are kept in first class working order, by carrying out strictly all orders looking to accident prevention, but it is his duty to himself, to his fellow-workmen and to his employers to keep others from danger through recklessness, negligence or ignorance.

The self-reliance of the American citizen, splendid as it is in so many respects, has bred a spirit of resistance to discipline, and a disposition not to interfere with the acts of others, which must affect adversely the attainment of the best results in accident prevention. Until the fact is realized that personal freedom of action must be partly sacrificed for the good of all, as well as for the good of the individual, American industrial plants will be the scene of an undue number of accidents. Sharper discipline must be enforced, and, as a first step, any act imperilling the life or limb of a fellow-workman should be followed by the immediate discharge of the offender.

HOW TO PREVENT ACCIDENTS

The watchwords in every industrial plant in the United States should be complete safeguards, everlasting vigilance and strict discipline, and the only trustworthy means for the attainment of the ends sought is frank and constant co-operation between employers and workmen.

The material from which this manual of safety was drawn has been taken from the exhibits installed in the American Museum of Safety and from personal visits of inspection at some of the largest plants in this country. The illustrations selected are simple, practical, convincing and, for the most part, inexpensive. The ex-



Fig. 5—Swinging Safety Gates to Shop Entrances

hibitors at the Museum of Safety whose experience has been drawn upon are the National Tube Company, Carnegie Steel Company, Lackawanna Steel Company, Illinois Steel Company, Pennsylvania Steel Company, and Allgemeine Elektricitäts Gesellschaft. All these and many other exhibits are always accessible at the museum, to which industrialists and the public are cordially invited, and we trust that they will make use of it, as the conservation of human life is the question of the day; by their visits they will stimulate and promote the work undertaken.

Some of the Safeguards Shown in the Manual

A few illustrations shown in the manual referred to are reproduced herewith to indicate the character of the contents. Figs. 1 and 2 show what is being done for the protection of the craneman.

Before the days of the safety committee no provision was made for the craneman to reach his crane crib. He got there as best he could, usually by shinning up the lattice work of a column.

To-day the craneman reaches the cab by means of steel stairways, properly railed, with a landing at the top. Now the craneman can walk, carrying tools, oil or waste with perfect safety. The landing platform at the top is also used by workmen repairing the crane trucks.



Fig. 4—An Approved Car Shifter

Sometimes the transfer of a load from the car to the hoisting chain, by the direction of the latter, will cause the car to move. Men standing by are liable to have their toes or feet crushed before they can be moved out of the way of the car. A safeguard for this, in use by the Allgemeine Elektricitäts Gesellschaft in Berlin, as shown in Fig. 3, consists of a steel bar bent at an obtuse angle and fastened by drop pieces from the frame of the car.

The old type of car shifter was a bar, operated by a downward push. If the bar slipped the operator ran the risk of falling forward and crushing his hand between the bar and the rail. With the safety bar, as shown in Fig. 4, the man pulls up to move the car along, while the hook on the handle prevents the hands from slipping off. This safety device was originated by an employee at the National Tube Company.

In Fig. 5 are shown swinging safety gates to the entrance of shops near railroad tracks.

A pipe iron guard, bent in an inverted V, as shown in Fig. 6, warns the men coming out of the shop of the danger of passing trains. In this mill, as in the case of so many others, every inch of yard space is at a premium, hence the necessity for this kind of safeguard.



Fig. 6—A Pipe Iron Guard at a Shop Exit

A bit of shop experience is thus related: "My superintendent had a narrow escape the other day, but the workman with him was not so fortunate. They were going through the factory when a pile of metal carelessly stacked up fell over. It just missed the superintendent, but the



Fig. 7—A Safe Way to Pile Metal

poor workman was fatally crushed." A small strip of metal turned up at each end in a curve, as shown in Fig. 7, holds the stock in position, with no danger of the metal slipping. It is also an economy, as the metal can be piled to the ceiling, thereby storing more material in less space.

The Hartmann, Hay & Reis Company is the successor to the firm of Hartmann, Hay & Reis, Belleville, Ill., and will continue to manufacture iron and steel cut nails, but expects in the near future to get into other iron and steel products. It is not starting a new plant, but has taken over the old works of Hartmann, Hay & Reis. The officers are: Bernard Hartmann, president; Ernst E. Wan-gelin, vice-president and manager, and Henry Reis, secretary.

The Taylor Iron & Steel Company, High Bridge, N. J., has opened an office in the Fort Dearborn Building, 105 West Monroe street, Chicago, of which H. A. Johann will be in charge as district sales manager. All inquiries and orders for the company's material in his territory are to be sent to him.

Recent Pelton Water Wheel Installations

The Pelton Water Wheel Company, San Francisco, Cal., has secured a contract for supplying an 1800 hp. turbine for the Companiera electric light and power plant near Sao Paulo, Brazil. The specifications call for a turbine to operate at 400 r.p.m. under a 75 ft. head, also for a pipe line, gate valve and other equipment; the turbine to be direct connected with a 1000 kw. generator. This will make the third turbine which the Pelton Water Wheel Company has installed in the Brazilian plant.

The East Creek Electric Light & Power Company's plant near Ingham Mills, about eight miles from Little Falls, N. Y., consisting of two 4000 hp. Pelton-Francis turbines and two 2500 kw. General Electric generators, has been placed in partial operation, the first unit having been started in synchronism with the steam plant of the same company at Tribeshill. This unit went into successful operation as soon as the water was turned on, producing about 3200 kw. The second unit will be started up in a few days. The plant is operating under a head of about 105 ft. The water is impounded by a concrete dam approximately 100 ft. in height and is conducted to the turbines by a supply pipe 9 ft. in diameter and 400 ft. in length. On a hill about 160 ft. from the power house is a standpipe approximately 20 ft. in diameter and 60 ft. in height. Provision has been made for a third unit which probably will be installed in the near future.

The East Creek Company's turbines are of the vertical type with the generators mounted on top. Pelton oil governors are used, and the regulation obtained is conceded to be better than that at the steam plant at Tribeshill. The conditions under which the governors operate are particularly severe, as there are frequent changes of from 50 to 75 per cent. in load, often within a few seconds. The admission of water to each turbine is controlled by a butterfly valve of which the Pelton Water Wheel Company makes a specialty. The diameter of the valves is 72 in., and they are practically tight under full pressure. They are balanced and can be operated by one man with hand mechanism. This type of valve is coming into favor rapidly because of its low cost and the ease with which it can be operated mechanically, even under pressures of 200 to 300 lb. The turbines were designed and built by the Pelton Water Wheel Company, the consulting engineers being Viele, Blackwell & Buck, 49 Wall street, New York City. The electrical apparatus was supplied by the General Electric Company, Schenectady, N. Y.

The Ohio University Installs Large Apparatus

The latest important addition to the hydraulic section of the mechanical engineering laboratory plant at the Ohio State University at Columbus, Ohio, for testing purposes is a Henry R. Worthington centrifugal pump with a capacity of 17,000,000 gal. per day, direct connected to a 250-hp Buckeye vertical cross-compound engine. The pump, which is built for a total head of 50 ft., raises the water 12 ft. from a large cistern, and forces it into another about 50 ft. from the first, through a 22-in. suction and a 20-in. delivery pipe. As the water would be too turbulent to measure while passing from the second cistern on account of the force with which it enters, it passes into a third, or middle, cistern, to quiet down. From this it is measured while passing over a weir to the first and its capacity determined. By disconnecting the pump and using the friction brake the horsepower of the engine can be found. In this way the efficiency as well as the capacity of the pump can be determined. The installation of this unit is following out the policy of the engineering department in its belief that the use of large apparatus more nearly conforms to machinery with which the student will have to contend after he leaves the university. More and more are the engineering students of present times being brought in touch with practical conditions.

Novel Gasoline Locomotives

Eliminating the transmission gearing ordinarily employed in motor-driven road vehicles and substituting a friction transmission is the particular feature which differentiates a new line of gasoline locomotives built by the Plymouth Motor Truck Company, Plymouth, Ohio, from the other types now on market. These locomotives are

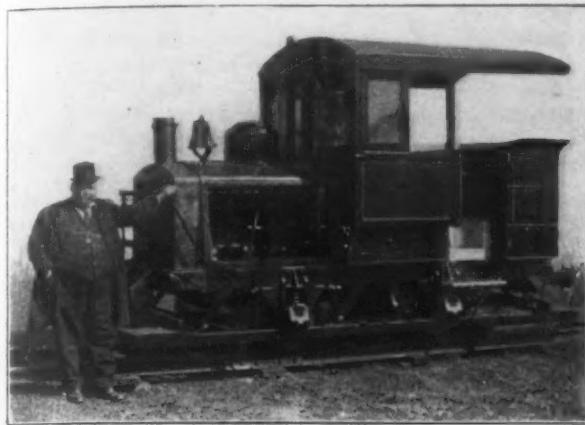


Fig. 1—A New Type of Gasoline Locomotive Having a Novel Friction Drive Built by the Plymouth Motor Truck Company, Plymouth, Ohio

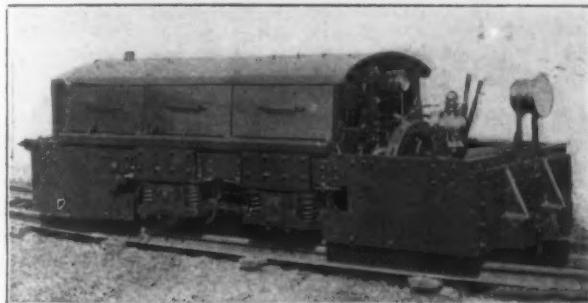


Fig. 2—A Locomotive for Use Where Headroom is Limited

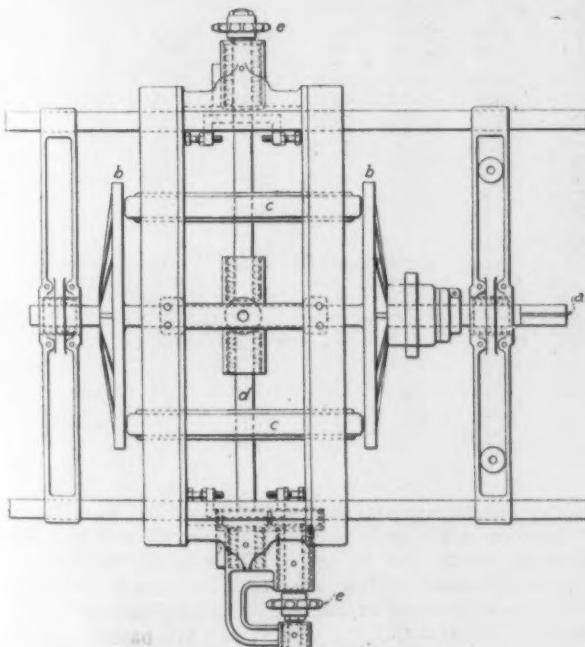


Fig. 3—Details of the Friction Drive

intended for industrial work and are made in two different styles, one for outdoor work which is fitted with a cab as shown in Fig. 1 and the other which is illustrated in Fig. 2 is intended for use where the headroom is limited. The double friction transmission employed is shown in Fig. 3.

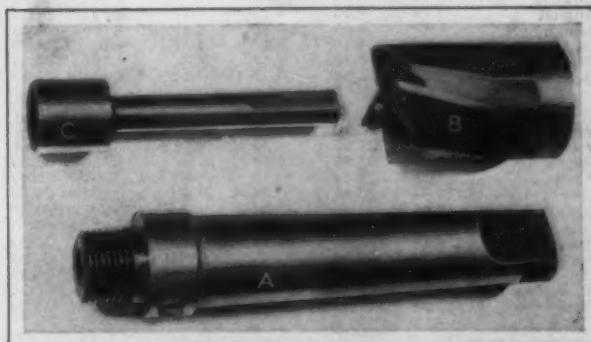
Referring to Fig. 3 which is an assembly drawing of the particular type of transmission used, the engine shaft

a extends back under the chassis and has two aluminum disks *b* mounted upon it, the size varying according to the power to be transmitted. These can be shifted either backward or forward for a very short distance to bring them in contact with the friction wheels *c* which are placed on short shafts *d*, running across the chassis between the disks. By bringing the forward disk into contact with the friction wheels movement in the forward direction is obtained while by bringing the other disk into contact the direction of movement is reversed. From the friction wheels the power is transmitted to the hubs of the driving wheels of the locomotive by the sprocket chains *e*. One of the advantages claimed for this type of drive is that the slack between the different cars is taken up as the locomotive starts and there is no jerking that would eventually break the gear teeth. In this way a drive the same smoothness as that of the steam locomotive is secured.

These locomotives are built in a number of different sizes and styles. That illustrated in Fig. 1 is what is known as the intermediate size having an over-all length of 18 ft. It is equipped with a slow speed marine type gasoline engine having four cylinders, 6 in. in diameter and 7 in. long. The four wheels are 24 in. in diameter and the tread is 36 in. The locomotive equipment includes a dual ignition system, a standard air brake and an air whistle. Tests made on a smaller locomotive weighing about $2\frac{1}{2}$ tons and designed for use on a 2-ft. track demonstrated its ability to haul a train of cars loaded with clay and weighing from 30 to 40 tons.

National Counterbore

Recently the National Tool Company, Cleveland, Ohio, has placed on the market a patented counterbore, consisting of three parts. These parts are the shank, the cutter and the pilot, and as the last two are interchangeable and are furnished with taper, straight or double-grooved shanks, the purchaser secures a high speed counterbore at a low price and at the same time enjoys the advantages of an interchangeable pilot.



View Showing the Various Parts of a New Type of Counterbore Made by the National Tool Company, Cleveland, Ohio

The shanks *A* are made of machinery steel and are threaded and ground to a true cylindrical surface. The cutters *B* which are high speed steel are screwed to the shanks. The hole for the pilot *C* is ground through the other two parts, thus insuring a true fit for this piece throughout its entire length. A set screw on the shank holds the pilot in place and relieves it from any strain, all the cutting strains from the cutter being taken up on the shank. The cutters are fluted spirally to give a shearing cut, and they can be ground and used for two-thirds of their length. The cutters and pilots which are carried in stock in sizes varying by sixteenths from $\frac{3}{4}$ to 4 in. are interchangeable and are furnished with taper, straight or double-grooved shanks.

A New Port Henry Furnace.—The Northern Iron Company is planning for the building of a new furnace to replace the one it is operating at Port Henry, N. Y., under lease from the Delaware & Hudson Company. Construction work will probably begin in April, when the present furnace will be blown out on the cleaning up of orders now on hand. The new stack will probably be 80 x 17 ft.

New York Metal Prices for Fourteen Years

Monthly Averages Computed from the Weekly Market Quotations of "The Iron Age" in the Period 1898-1911

(With Supplement.)

The accompanying supplement shows by plotted lines the fluctuations in prices of the more important metals in the period from 1898 to 1911, inclusive. The prices used for this purpose are the computed monthly averages of the prices of carloads, at New York, given in the metal market reports of *The Iron Age* week by week.

The columns of figures alongside the chart give the values. The column to the left gives tin in cents per pound; the middle column, copper in cents per pound, and the first represents lead and spelter in cents per pound and tin plate in dollars per base box. The following tables give the monthly averages, on which the chart is based:

Months	Lake Copper in Cents per Pound.													
	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911
January	11.00	14.02	16.21	16.90	11.45	12.13	12.62	15.18	18.78	24.41	13.90	14.56	14.00	12.81
February	11.19	17.66	16.25	16.97	12.47	12.80	12.34	15.25	17.94	25.10	13.13	13.37	13.78	12.75
March	11.95	17.55	16.41	17.00	12.12	14.31	12.60	15.25	18.50	23.38	12.85	12.90	13.75	12.58
April	12.05	18.56	17.00	17.00	11.97	14.85	13.19	15.18	18.62	24.62	13.09	12.94	13.31	12.41
May	12.04	18.65	16.80	17.00	12.10	14.75	13.28	15.00	18.70	24.10	12.88	13.21	13.06	12.33
June	11.85	18.20	16.31	17.00	12.23	14.56	12.74	15.00	18.69	23.94	13.00	13.50	12.88	12.71
July	11.59	18.37	16.31	16.97	11.94	13.73	12.62	15.03	18.47	21.95	13.00	13.34	12.66	12.78
August	11.85	18.50	16.55	16.50	11.59	13.35	12.50	16.07	18.65	18.94	13.71	13.56	12.93	12.75
September	13.25	18.47	16.75	16.50	11.60	13.58	12.67	16.12	19.31	16.41	13.80	13.50	12.81	12.65
October	12.37	18.03	16.73	16.71	11.71	13.42	13.09	16.62	21.81	13.80	13.81	13.19	12.84	12.53
November	12.69	17.00	16.75	16.82	11.44	13.25	14.22	16.90	22.50	13.94	14.44	13.44	12.98	12.80
December	12.79	16.69	16.87	14.71	11.61	13.00	14.87	18.75	23.06	13.48	14.53	13.80	13.00	13.84
<hr/>														
Spelter in Cents Per Pound.														
January	3.75	4.90	4.55	4.08	4.28	4.82	4.95	6.17	6.48	6.90	4.54	5.15	6.26	5.55
February	3.79	5.68	4.69	3.94	4.18	5.00	4.95	6.12	6.09	7.00	4.78	4.99	5.89	5.56
March	4.00	5.99	4.60	3.89	4.29	5.36	5.05	6.06	5.96	6.92	4.76	4.81	5.72	5.65
April	4.00	6.25	4.71	3.94	4.41	5.65	5.22	5.97	6.05	6.81	4.68	4.94	5.60	5.51
May	3.95	6.72	4.52	3.97	4.50	5.75	5.14	5.55	5.95	6.51	4.60	5.12	5.20	5.50
June	4.65	6.02	4.27	3.95	4.88	6.00	4.79	5.32	6.14	6.45	4.56	5.39	5.19	5.63
July	4.51	5.79	4.24	3.90	5.23	5.95	4.85	5.38	5.98	6.15	4.46	5.35	5.20	5.79
August	4.35	5.55	4.17	3.92	5.46	5.94	4.85	5.66	6.06	5.71	4.71	5.74	5.26	6.04
September	4.62	5.40	4.10	4.02	5.45	6.00	5.06	5.83	6.19	5.28	4.76	5.85	5.53	6.03
October	4.61	5.37	4.10	4.20	5.48	6.05	5.17	6.05	6.18	5.45	4.81	6.09	5.69	6.20
November	5.09	4.64	4.20	4.32	5.29	5.68	5.49	6.17	6.36	5.10	5.03	6.32	5.95	6.60
December	5.13	4.68	4.19	4.35	4.91	5.15	5.80	6.50	6.62	4.39	5.17	6.35	5.80	6.44
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Lead in Cents Per Pound.														
January	3.66	4.02	4.70	4.37	4.02	4.10	4.39	4.56	5.86	6.30	3.73	4.19	4.70	4.50
February	3.69	4.53	4.70	4.37	4.10	4.10	4.40	4.50	5.56	6.31	3.75	4.07	4.63	4.46
March	3.71	4.37	4.70	4.37	4.10	4.44	4.50	4.45	5.35	6.31	3.88	4.02	4.51	4.41
April	3.61	4.30	4.70	4.37	4.10	4.59	4.50	4.50	5.39	6.16	4.02	4.19	4.40	4.44
May	3.64	4.42	4.22	4.37	4.10	4.37	4.48	4.50	5.90	6.02	4.26	4.32	4.37	4.40
June	3.86	4.45	3.90	4.37	4.10	4.25	4.22	4.51	5.94	5.75	4.45	4.36	4.38	4.46
July	3.95	4.55	4.03	4.37	4.10	4.12	4.17	4.56	5.86	5.24	4.50	4.35	4.40	4.50
August	3.99	4.56	4.26	4.37	4.10	4.12	4.15	4.64	5.78	5.12	4.59	4.36	4.40	4.50
September	3.99	4.60	4.36	4.37	4.10	4.26	4.20	4.85	5.92	4.84	4.54	4.39	4.40	4.49
October	3.81	4.59	4.37	4.37	4.10	4.40	4.20	5.07	5.94	4.64	4.34	4.39	4.40	4.31
November	3.70	4.58	4.37	4.37	4.10	4.25	4.51	5.48	5.97	4.45	4.39	4.40	4.44	4.31
December	3.62	4.65	4.37	4.19	4.10	4.19	4.60	5.96	6.19	3.76	4.24	4.56	4.50	4.45
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Tin in Cents per Pound.														
January	13.77	22.12	26.00	26.60	23.38	27.76	28.75	29.18	36.36	42.14	27.43	28.19	32.61	41.20
February	14.04	24.25	29.71	26.55	24.73	29.14	27.98	29.49	36.48	42.16	28.74	28.44	32.65	43.34
March	14.26	23.86	32.42	25.95	26.16	30.06	26.19	29.21	36.62	41.29	30.46	28.75	32.51	41.10
April	14.41	24.82	30.85	25.94	27.29	29.69	27.99	30.43	38.86	40.84	31.79	29.35	32.83	42.05
May	14.54	25.61	29.25	26.82	29.26	29.36	27.76	30.04	43.08	43.01	29.84	29.07	33.05	43.32
June	15.05	25.69	30.00	28.22	29.29	28.30	26.14	30.36	38.97	42.65	28.18	29.26	32.79	46.25
July	15.60	28.72	32.76	27.41	28.28	27.60	26.28	31.71	37.18	41.15	28.92	29.05	32.99	43.23
August	16.14	31.40	31.13	26.90	28.14	28.00	26.74	32.85	39.90	37.35	29.99	29.96	33.92	43.38
September	16.02	32.40	29.63	25.04	26.35	27.06	27.27	32.21	40.32	37.22	28.91	30.00	35.17	39.69
October	17.25	31.35	28.46	24.62	25.76	25.83	28.53	32.47	42.90	32.33	29.44	30.41	36.76	41.23
November	18.07	28.52	28.10	27.47	25.43	25.35	29.00	33.46	42.70	30.81	30.43	30.74	37.38	43.08
December	18.20	25.19	26.84	24.39	25.33	27.53	29.27	35.84	42.62	27.92	29.13	32.91	38.21	45.03
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Tin Plate in Dollars per Box.														
January	\$3.05	\$3.11	\$4.84	\$4.19	\$4.19	\$3.79	\$3.75	\$3.74	\$3.66	\$4.09	\$3.95	\$3.89	\$3.84	\$3.84
February	3.02	3.50	4.84	4.19	4.19	3.79	3.64	3.74	3.69	4.09	3.89	3.84	3.92	3.92
March	2.90	4.03	4.84	4.19	4.19	3.90	3.64	3.74	3.69	4.09	3.89	3.74	3.84	3.94
April	2.90	4.10	4.84	4.19	4.19	3.99	3.64	3.74	3.76	4.09	3.89	3.64	3.84	3.94
May	2.89	4.05	4.84	4.19	4.19	3.99	3.64	3.74	3.85	4.09	3.89	3.64	3.84	3.94
June	2.85	4.05	4.84	4.19	4.19	3.99	3.64	3.74	3.94	4.09	3.89	3.64	3.84	3.94
July	2.84	4.38	4.84	4.19	4.19	3.99	3.60	3.74	3.94	4.09	3.89	3.64	3.84	3.94
August	2.82	4.60	4.84	4.19	4.19	3.99	3.49	3.74	3.94	4.09	3.89	3.64	3.84	3.94
September	2.85	4.82	4.68	4.19	4.19	3.99	3.49	3.74	3.94	4.09	3.89	3.66	3.84	3.87
October	2.75	4.82	4.19	4.19	4.19	3.99	3.49	3.55	3.94	4.09	3.89	3.74	3.84	3.74
November	2.80	4.83	4.19	4.19	3.79	3.84	3.56	3.53	4.09	4.09	3.89	3.79	3.84	3.64
December	2.89	4.84	4.19	4.19	3.79	3.79	3.56	3.59	4.09	4.09	3.89	3.82	3.84	3.64

Steel Manufacturers and Tariff Reductions

As indicating the feeling of the iron and steel manufacturers toward the proposed sharp reductions in iron and steel duties which are now in preparation at Washington, we have before us a copy of a letter addressed to a member of the House of Representatives referring to the unprofitable period through which the iron trade has been passing. The letter expresses the belief that such tariff legislation as is threatened will put the manufacturers of iron and steel back where they have been for the past 12 months, selling at cost. Viewing the matter from the standpoint of the sheet industry in particular, the letter says that, while there has been a radical reduction in prices of finished steel mill products, the makers of hardware specialties, household utensils and other articles produced from finished steel are still getting the same amount of

money for their goods. It is stated that if there are further reductions in the tariff the inevitable result will be reductions in wages; that so far the wage earner has not suffered, the burden falling upon steel manufacturers, whose millions of invested capital are bringing no reasonable returns.

The Eighth International Congress of Applied Chemistry, of which William H. Nichols is president and Bernhard C. Hesse is secretary, 25 Broad street, New York, has issued a circular giving the rules which have been adopted on papers to be presented at the approaching meeting, to be held in Washington and New York, in September, 1912. All papers and their abstracts, both in duplicate, must be in the hands of the American committee not later than June 30.



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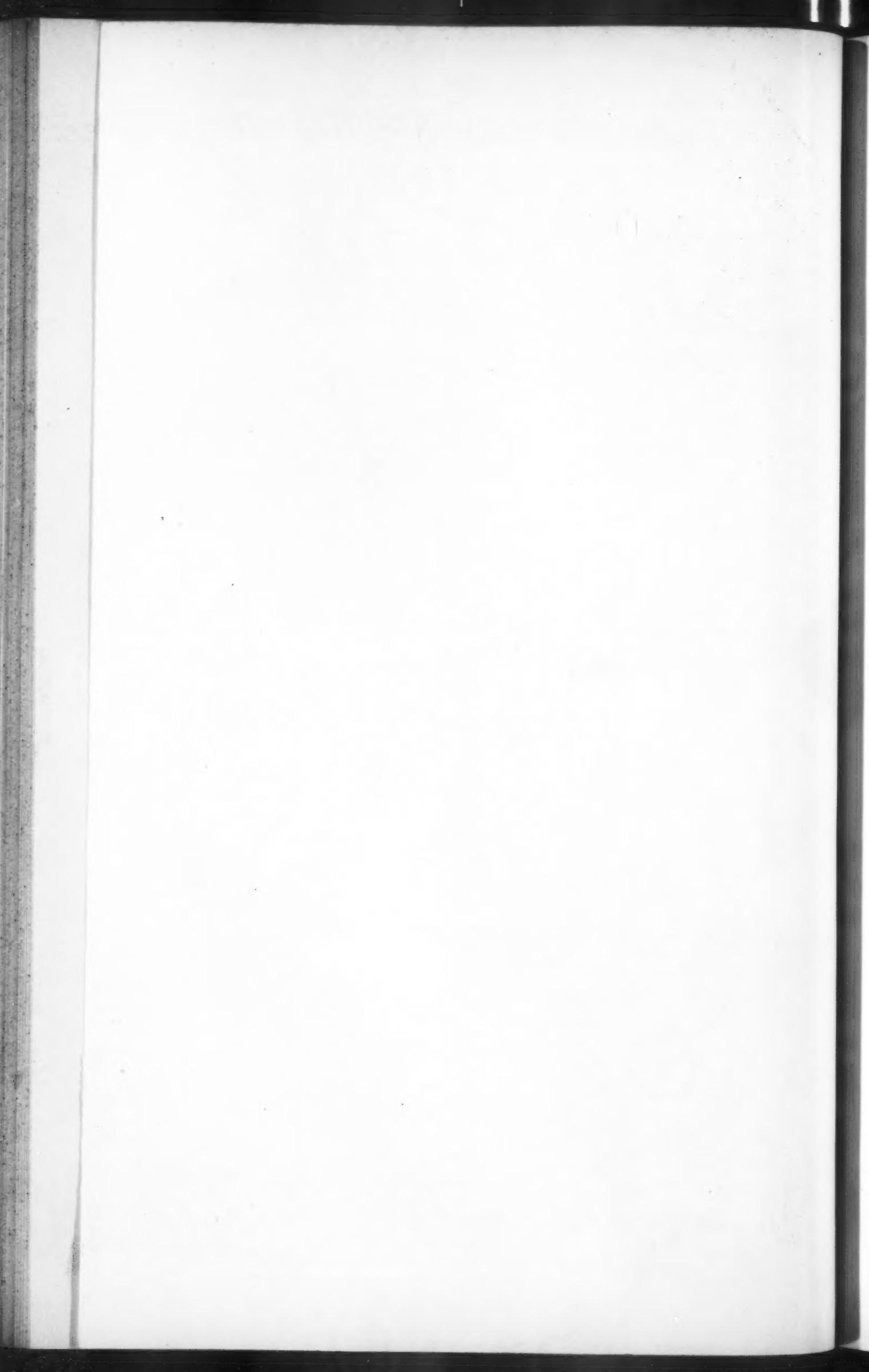
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Fluctuations in the Prices of Lake Copper, Lead, Tin, Spelter and Tin Plate in New York from January 1, 1898, to December 31, 1911, in Carloads



Die Castings*

BY AMASA TROWBRIDGE†

The art of die casting, that is, the making of castings in steel molds to finished size and shape, was first introduced in connection with the manufacture of type, the first successful attempt in the United States being made about 1735. When the casting of type was perfected, it saved so much time that its usefulness for making other pieces which were wanted in large quantities was at once evident. Accordingly many men have made efforts to perfect a machine or process by which they could turn out finished castings correct as to size and shape. Since type was first successfully cast it is natural that the same methods should be used for making other castings. So far no material superior to steel, the material used for type molds, has been found for making the matrices. Brass can be and is used where the casting is very intermittent as in a linotype machine, but for continuous work and where accuracy and truth are required, steel is necessary.

The next consideration after the material for the dies is that for the castings.‡ There are only a few common metals with a melting point sufficiently low to be cast in steel dies, because these do not have to be brought to their melting point to be spoiled. In general, the method of making a casting is as follows: A suitable die or mold is made in steel. This must be so arranged that when opened, the casting will either drop out or be easily ejected. The die should have the fewest possible partings. This is important because it is easier to hold the casting to correct size when the die is in a few pieces than when it is in many. This operation is generally carried on in so-called hand-casting machines,§ that is machines operated by manual labor. Automatic machines are in use and have great advantages in producing uniform castings because the conditions do not vary. The automatic machine is run at a constant speed and is not subject to varying conditions due to the operator becoming tired. Hand-casting machines produce quantities of 500 per day, more or less, depending on the size and complexity of the piece. Automatic machines produce the castings much more rapidly and save on labor just as does any other type of machinery.

A difficulty due to shrinkage is sometimes encountered when these castings are to be used in connection with parts made by some other process. While the shrinkage

will be the same in two castings made in the same die if the metal is properly handled, it does not always follow that it is proportionately the same when they are made from different molds. It is affected to a marked degree by the form of the casting, and if the castings are to be used in connection with machined pieces, it is advisable that these be machined to fit the casting. When it is not possible to do this and the casting must be fitted to existing pieces, sample castings should be made, and if these are not correct, the dies can be altered

to make castings that are correct. The greatest gain obtains when an entire machine can be made of such castings. One of the best examples of this is the Veeder cyclometer so universally used on bicycles. This instrument is composed of about a dozen die castings and nearly as many parts of other materials. The number rings have 0.001 in play, and yet these castings are made in enormous lots and, without being gauged, are assembled into the die-cast cases where they fit and work properly. So exact are these castings that when new, the instruments work more easily without lubrication than with it. This would obviously be possible only where the clearances are extremely small. A small dimension on these castings can be maintained to 0.0001 in.

*From a paper presented at the annual meeting of the American Society of Mechanical Engineers, New York, December 7, 1911.

†Factory Manager, Veeder Mfg. Company, Hartford, Conn.

‡An article by E. F. Lake, entitled "Alloys Used for Die-Castings" appeared in *The Iron Age*, September 7, 1911, p. 532.

§The various types of machines used in the process were described in an article by E. F. Lake, entitled "Die Casting Machines," which appeared in *The Iron Age*, April 27, 1911, p. 1026.

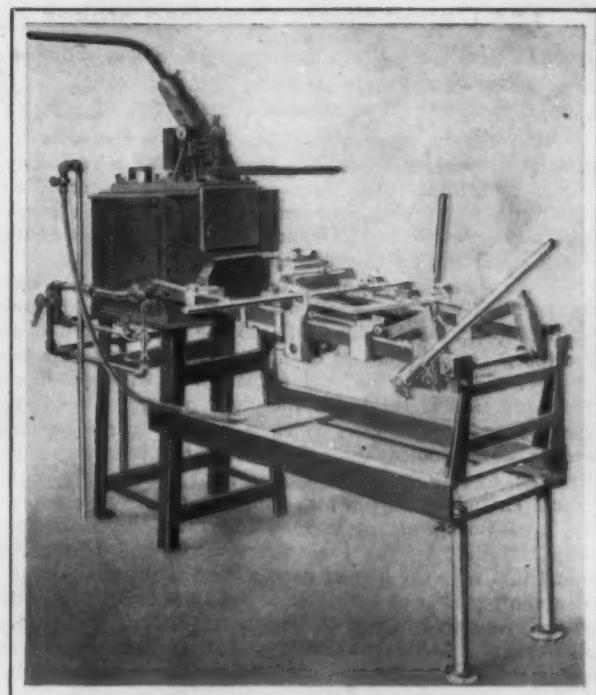


Fig. 2—A Machine for Making Die Castings Built by the Loss Mfg. Company, Brooklyn, N. Y.

The strength of die castings is of course largely dependent on the alloy, and also on the method of casting. Unless proper precautions are taken to insure sound castings, much trouble will be encountered from blow holes. This is a case exactly parallel to that found in making iron castings. The shrinkage of the ordinary die casting is not as great as that of cast iron, and some of the tin alloys particularly shrink scarcely at all. Another similarity to iron molding is found in the fact that the outside skin of the die casting is ordinarily stronger and harder than its interior. The hard outside skin is always desirable on a die casting, because the piece being cast to its finished size and no cutting being required, it is this outside skin which is first subjected to wear.

Very little idea can be given of the cost of parts manufactured by the die-cast method. The tools or dies are costly or otherwise, according to their complexity or their simplicity. The time for casting a complicated piece is little, if any, greater than for a simple one. From this it follows that the more complicated the casting, or the more difficult it would be to machine, the greater will be the saving effected by the use of die castings. The number of pieces to be made from a die is also pertinent, for hundreds of thousands of pieces can be made from some dies with no injury whatever to them. Other dies may need frequent repairs due to unavoidably weak points in their construction. Number wheels having internal or hooded gear teeth are good examples of parts which are profitably made by this process. The set of number wheels and pinions shown in Fig. 1 will serve as a fair example for the comparison of costs by hand-casting, machines and by automatic machines. The dies for this set of wheels and pinions for a hand machine would cost in the neighborhood of \$450. The number-wheel castings would cost, in lots of 1000, about 10c. each, and in lots of 10,000, about 8½c. each. The pinion castings in lots of 1000 would be 4c. each and in lots of 10,000 would be 3c. each. The cost of the dies for an automatic machine for the same wheels and pinions would be about \$2,000. The number-wheel castings in lots of 10,000 would cost about 2½c. each, and in lots of 25,000 or more about 2c. each. The pinion castings would cost about 1½c. in 10,000 lots and in 25,000 or more lots, about 1c. each.

Fig. 2 shows the Soss die-casting machine. This machine is offered for sale and enables a manufacturer to make his own die castings with a comparatively inexpensive equipment.

Boston is showing activity in opposing the closing of the local navy yard that is being considered in concentrating the northern Atlantic stations in Narragansett Bay.



Fig. 1—A set of Number Wheels and Pinions Produced by the Die-Casting Method

The United States Overfeed Stoker

Recent Development of the American Stoker Company
Having Alternate Stationary and Oscillating
Water-Cooled Grates

After fifteen years of building underfeed stokers the American Stoker Company, 11 Broadway, New York City, has expanded its activities and brought out a stoker of the overfeed type. Front, rear and side elevations of the new stoker are given in Fig. 1, while Fig. 2 shows details of the moving and the fixed grates employed.

The stoker consists of an ordinary hopper, into which the fuel is delivered. Reciprocating pushers in the bottom of the hopper shove the coal into the furnace and upon the top grate, the amount of pusher travel being adjusted to meet the demands of the furnace. It will be noticed from the side elevation, at the right of Fig. 1, that the back plate of the hopper, which is exposed to the furnace fire, is water cooled, the object being to prevent the destruction of the plate by the heat of the fire and also keep it cool enough at all times to eliminate any trouble due to the coal fusing in the hopper and thus preventing the proper feeding of the fuel. Another special feature in connection with the hopper construction is the employment of a short pusher at each side to feed the fuel to the side of the grate, irrespective of the amount of coal fed to the other parts. In this way, it is emphasized, the formation of air holes along the side walls of the furnace, where the fuel burns very rapidly, is prevented.

As can be seen by examining the rear elevation of the stoker in the center of Fig. 1, the grate surface, with the exception of the ash dump, is composed of a series of horizontal shelves arranged as steps. These grates extend across the furnace and form an incline of approximately 36 deg., thus providing an ample air space between the grates. The grates are arranged in two series, alike in design, but alternately fixed and moving, as is clearly brought out in Fig. 2. The fixed grates are securely bolted to the side risers adjacent to the furnace walls, and addi-

tional stationary risers extending through the central portion of the stoker. The moving grates are located between the fixed ones, being thus supported and securely bolted to the moving risers, which are supported at the lower end by rollers and at the upper one by arms attached to eccentrics upon the stoker shaft.

The number of revolutions of this shaft is entirely under the control of the attendant, and, as the eccentrics have a constant travel, the extent of their motion is thus unchanged. An ingenious arrangement of knuckle-joint swing link and set screws enables the motion of the grates to be modified to suit the particular requirements of the different kinds and grades of fuel. For coking coal the grates can be adjusted to travel in the path of an ellipse, as indicated by the dotted lines in Fig. 2, or can be changed at once so that the forward motion is in a straight line, while on the return the grates can rise more or less than in the arc of an ellipse, thus carrying the grate clear of the loose coal which may lie upon the rear of the grate below it at all times. It is pointed out that the motion of the grates is such that the coal is compelled to travel at a uniform thickness from the top or front of the furnace to the rear at all times, the grate assuming the rôle of a positive pusher in its relation to the next one. Not only does this feature apply to the coal and the burning fuel, but to the ash and the clinker also, so that the latter are discharged upon the ash dump at the rear and the bottom in the course of time. Another special advantage claimed for this arrangement is that, on account of the overlapping of the grates, it is impossible for any fuel, no matter how fine, to sift through the grate into the ash pit.

The ash and clinker dumping apparatus are especially distinctive features of this new stoker, and with this it is possible for the attendant to extract and separate the ash and the clinker from the unburned fuel without any effort on his part other than the simple operation of the various parts. This special dumping arrangement is shown in the middle portion of Fig. 1, and its great advantage is that neither during nor after the process of dumping is any cold air admitted to the furnace, since the

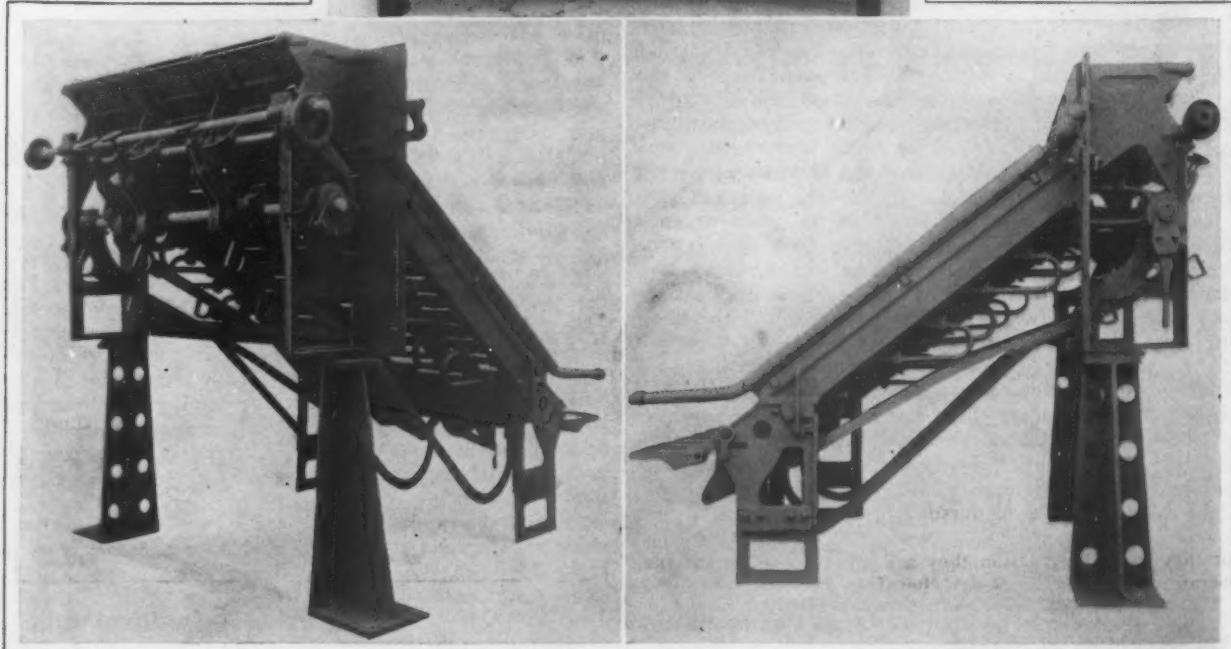


Fig. 1—Front, Rear and Side Elevations of the United States Overfeed Stoker Made by the American Stoker Company, New York City

space occupied by the dumping grate is covered at all times with burning fuel.

A water-back cylinder, constructed of standard steel

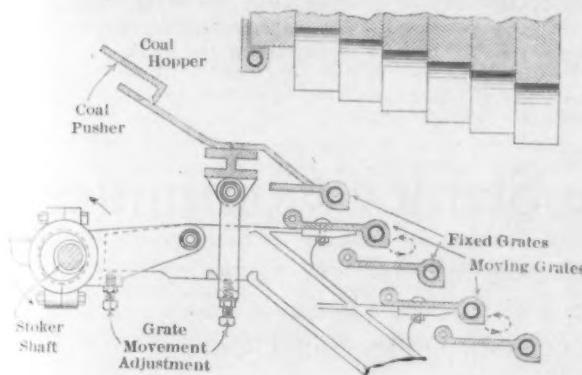


Fig. 2—Details of the Stoker's Construction

boiler plate and connected directly with the water circulation of the boiler, is partly embedded in the bridge wall. This cylinder has a standard size boiler manhole and blow-off pipe for cleaning. It is claimed for this cylinder that the adhesion of clinkers to the bridge wall is prevented, the ash-dumping arrangement works satisfactorily at all times and the expense of constant repairs to the bridge wall is eliminated. Each grate bar is prevented from burning by a continuous stream of water, which passes through that portion of the bar that is in direct contact with the burning fuel. The pipes used for this purpose are extra heavy, cold-drawn, seamless tubing, tested under a pressure of 1000 lb. per square inch. Before the grate bars are cast, these pipes, which have been bent to the proper shape, are laid in the molds and the iron poured around them. The connections from one grate to another are made by U-shaped pipes with specially constructed unions. This arrangement is shown in the front and side elevations at the left and right of Fig. 1. In making the connection for the water-cooling system, the moving grates are treated as one unit and the stationary ones as another. The piping runs from the boiler directly to the bottom grate of each series, and the water ascends from one grate to another until the top is reached, where another connection leads to the steam space of the boiler. One of the specially noteworthy features of this arrangement is the fact that there are no moving joints in connection with the entire installation.

The official call for the joint wage scale conference between the bituminous coal miners and operators of western Pennsylvania, Ohio, West Virginia, Indiana and Illinois has been issued by John F. White, president of the United Mine Workers of America, to be held in Indianapolis, Claypool Hotel, Thursday, January 25. The Pennsylvania and Ohio operators may not be at the conference, for they take the position they are not competitors of the operators of Illinois and will therefore not negotiate for a wage scale for all the States mentioned. This is the first time in many years that West Virginia has been included in the call. The miners will ask for 10 per cent. increase in wages, owing, they say, to the higher cost of living. The present scale expires April 1.

A Novel Molding Machine Job

An interesting molding machine operation was recently completed by the Ateliers de Constructions Electriques du Nord & De L'Est, Paris, France, with machines built by Ph. Bonvillain and E. Ronceray, S. A., 9 Rue des Envierges, that city. Views of the machine employed and the completed castings are given in Figs. 1 and 2 respectively.

The castings were the brackets or yokes employed in the construction of electric street railways, where the power is taken from an underground conductor. These yokes serve as a species of bracing for the rails, being enlarged as is shown in the lower part of Fig. 2 to support the conductor, while the parts curve closely together at the top to form a slot in which the plow on the bottom of the car travels. These pieces are spaced about 1 yd. apart, which gives some idea of the number of pieces required.

Except for a few minor alterations the castings were made according to the pattern shown in Fig. 1. The pattern was symmetrical with respect to the transverse axis, the molds employed followed roughly the shape of the casting and had a number of bars that varied in different styles. Where but few bars were used stripping plates

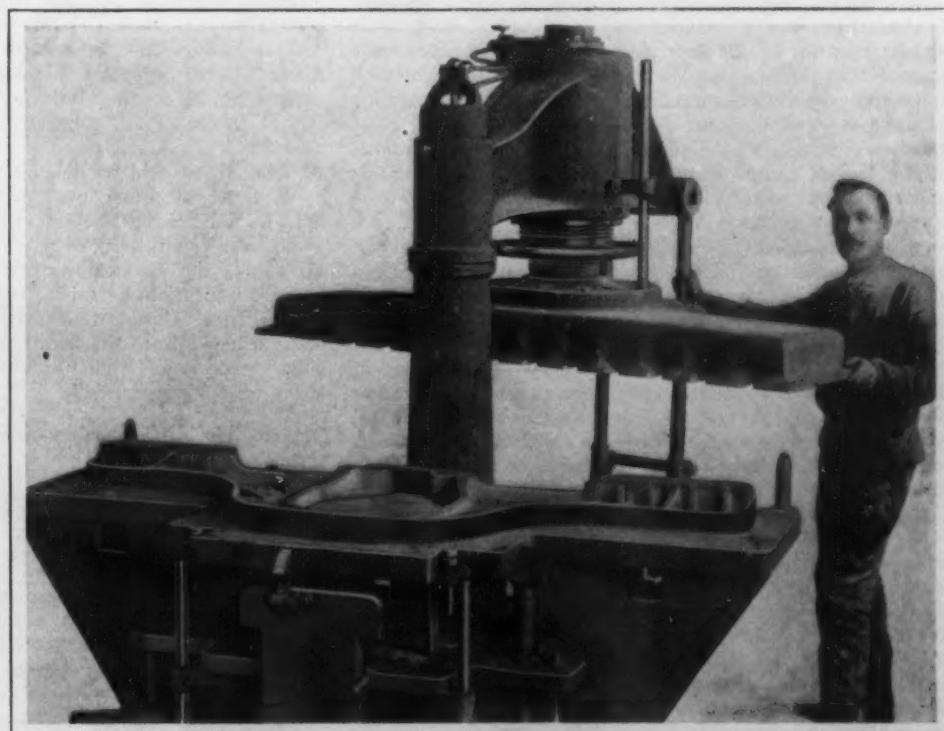


Fig. 1—Molding the Brackets to Support the Rails of the Paris Street Railway System on a Machine Built by Ph. Bonvillain & E. Ronceray, S. A., Paris, France.

were employed to assist in drawing the pattern except where a large number are cast. In this case the stripping

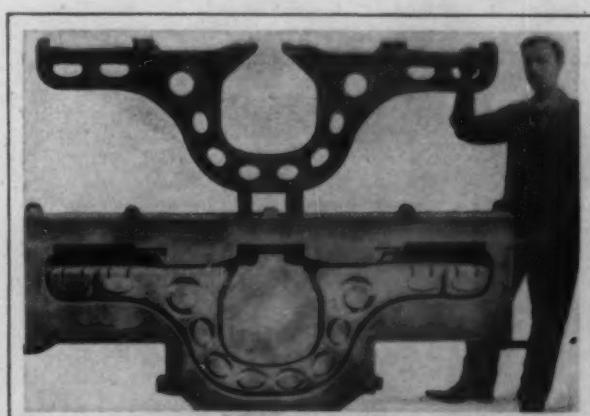


Fig. 2—The Mold and the Completed Casting

plates are dispensed with and the pattern is simply drawn by lifting the mold. In this construction four ribs are previously drawn by levers before the mold is lifted.

The molding itself was a very simple operation and presented no especially difficult features other than the large size of the piece. Some idea of the dimensions of the castings can be gained from an examination of Fig. 2 which shows the mold with a completed casting placed above it and a man standing at the side.

These castings, which weigh 375 lb., have been produced at the rate of from 35 to 40 pieces per day, this rate of production including the casting and the shaking out of the finished castings from the mold. The equipment required included one machine and a power traveling crane, six men being able to execute the work.

Carnegie Entertains the Stanley Committee

Expresses His Views on a Variety of Topics—Gives Little Information Not Previously Known—Believes in Regulating Large Corporations but Not Destroying Them

Andrew Carnegie was an involuntary witness January 10, 11 and 12 before the Stanley Committee of the House of Representatives, which is still probing the affairs of the United States Steel Corporation. He had been requested to appear, but having declined the invitation on the ground that he was one of the defendants in the Government suit against the corporation, was peremptorily summoned to Washington. His examination covered much familiar ground, especially to members of the iron trade. Not much information was elicited bearing upon the operations of the United States Steel Corporation, but the examination doubtless satisfied the dominant spirits on the committee in giving them the opportunity to put whatever questions they pleased to the man who was so long one of the greatest steel manufacturers in the world. They learned from his own lips what his opinions are on a variety of subjects.

As the examination extended over three days, the "testimony" was too voluminous to be given here in detail. Nor will an attempt be made to present anything like a continuous narrative of Mr. Carnegie's "revelations." Only the most important of his statements or those throwing a little more light on the operations of the Carnegie Company prior to the formation of the United States Steel Corporation will be reproduced.

After some details of his entrance into the iron business, which occurred in the early sixties, he related more or less interesting incidents in connection with the development of the Carnegie interests, their rapid growth, the acquisition of ore properties, the building of a railroad to bring ore from the Lakes to the blast furnaces at Pittsburgh, and gave a glimpse into some of his relations with the heads of great railroad systems through whom he secured preference on important rail contracts.

The Value of the Carnegie Steel Company

Throughout his examination he refused to enter into details of many transactions. "I am free to confess," declared he, "that I never saw the inside of a book of the Carnegie Steel Company. I always left the details to my partners at Pittsburgh. I lived mostly in New York or abroad. If my 25 partners were not able to take care of the details, I don't see how I could change the situation or improve it."

He asserted that the Government's suit against the Steel Corporation "blundered" and was "silly" in its declaration that the book value of the Carnegie Steel Company was \$84,000,000, because this did not begin to represent the real value of the Carnegie interest. All he and his partners received from the Morgan syndicate for the Carnegie interests was \$420,000,000, and all that the Carnegie family, Andrew, his sister-in-law, Mrs. Lucy C. Carnegie, and his cousin, received of the \$420,000,000 from the Morgan syndicate was \$213,000,000. He did not receive a cent of money and no stock in this transaction, but the payment was made wholly in bonds, despite statements to the contrary.

An interesting statement was made regarding the value of the Carnegie Steel Company immediately preceding its sale to the Morgan syndicate. The Carnegie Steel Company of New Jersey was only a holding company, and was organized under the laws of New Jersey because that State's laws gave greater powers through limited partner-

ship. There were issued \$160,000,000 of stock and the same amount of bonds. "This capitalization was determined not only by earning power, but by the increasing value of our ores and the hope that the property would in time meet the value of the securities. That the property was not overvalued is shown by the fact that we were asked to give an option for \$250,000,000 a year before we sold to the Morgan syndicate. That did not include the value of the Frick Coke Company, \$70,000,000, which brought it to \$320,000,000." The deal fell through, but \$2,000,000 was paid for the option.

Relating the story of how, through the mediation of Charles M. Schwab, he sold the Carnegie Steel Company, under the supervision of J. P. Morgan & Co., for \$420,000,000 to the syndicate which formed the United States Steel Corporation, he said: "What a fool I was to sell out to the Steel Corporation for only \$420,000,000! I have since learned from the inside that we could have received \$100,000,000 more from Mr. Morgan if we had placed that value on our properties."

No Special Concessions from Pennsylvania Railroad

Asked whether the Pennsylvania Railroad had made any special freight concessions to his company, Mr. Carnegie answered:

"Never that I knew of. I notice that Senator Oliver has asserted that we received rebates. It is startling how unsuspecting an honest person can be. I was the one man in all Pittsburgh that fought the Pennsylvania on its rates. I built the Bessemer road to the Lakes. I joined hands with Vanderbilt. I went to Europe. In my absence the Pennsylvania went to Vanderbilt and urged him to abandon the project. I returned from Europe to find that Vanderbilt had been captured by the enemy. I then went to George Gould and it was at my suggestion that he went into Pittsburgh with the Wabash, which has been frightfully mismanaged. The Pennsylvania rates from Chicago to the Huntington shipyards at Newport News on steel were lower than the rates from Pittsburgh to New York. I showed this to Roberts of the Pennsylvania; told him 'I can't stand it any more.' It did not seem to interest him, and I declared, 'All right, Roberts; you will send for me to see me the next time.' Then I arranged to build a road to the coke ovens. I got a note from President Roberts saying, 'I want to see you.' They made a special proposition that I should not build the road. I said: 'Let us see.' Then they did reduce their rate. Whether others got it I don't know. But when we bought the Carrie furnaces we found their coke rate was lower than the one I had got as a great concession. I don't know whether I got a lower rate than some one else."

He never had thought much of owning his own ore properties until he went to Minnesota to look over the field with the late Henry W. Oliver. "After I saw the lay of the land I declared that we would own our own ores." He added that he had bought a five-sixths interest in the Oliver mines for a few hundred thousand dollars. The Steel Corporation, as already stated by Chairman Stanley, had paid about \$18,000 for the remaining one-sixth held by the Oliver estate. Mr. Carnegie denied emphatically knowledge of any secret rate agreements that would have made the one-sixth of the Oliver company so valuable to the corporation. He said he remembered no such con-

tract, but Chairman Stanley said he was sure this was behind the anxiety of the corporation to control entirely the Oliver ore holdings.

His Views on the Tariff

Asked whether the tariff act of 1897 had anything to do with his company's marvelous increase in profits up to the time it sold out to the Steel Corporation, Mr. Carnegie said: "I don't know what was done with the tariff. The tariff never bothered me much. I don't think the Dingley law had anything to do with it. We have waves of prosperity and panic. Some years are quiet; no expansion. It takes time to get ore and fuel when you resume. Then you have several years of prosperity. You overdo it, and then quiet times come. It takes some time to meet the demand when prosperity returns in steel."

Mr. Carnegie took pride in his praise of the partnership arrangement under which he developed the Carnegie interests. "I don't believe any corporation can manage a business like a partnership. When we were partners we could run all around corporations. You take 25 young men, give them an interest in the business, and each one will be looking around for the leaks. I once made that statement, and Perkins told me I was foolish; now he thinks I'm right. The best corporation ever formed would be beaten by an organization such as we had in the Carnegie Company."

Questioned as to his views on the tariff, he declared he thought there should be free trade on steel. He told of the way the tariff on steel was first fixed. He thought young industries should be encouraged, but steel was no longer young. If some gentleman wished to start a needle factory, he would favor protecting the needle industry in its infancy. He continued: "I believe if we had free trade in steel of all kinds in this country importations would be inconsiderable. We pay higher wages than Germany, but our product per man is different. The market abroad does not justify them building the monster mills we have here. I don't agree with Charles Schwab's statement that once our market were thrown open it would be an inducement to Germany to develop their mills for that reason. I think that if what Schwab says were true I would not put the tariff on steel until it were shown to be needed. I don't agree with him. He's an interested party and I am not."

The Price of Steel Rails

Being asked about his company making rails for \$16 a ton in 1890 and whether the Steel Corporation could afford to sell them at that price, he said: "If they operated under the same conditions as we they could, but I do think a dollar a ton profit is very poor. I don't like to express opinions as to other people. I have a very foolish partiality or impartiality. Charley Schwab once made the statement that rails could be made for \$12. I added \$3 for charges on capital and losses through bad debts. I think that was not too high, considering the risks. It's simply astounding how much working capital you must carry in a great steel concern. It's far above the actual cost of the work. You have to wait for payments and get notes sometimes. I do not include depreciation. I don't believe in depreciation. A mill that don't improve is all wrong. There's where the partnership arrangements come in, because every man is interested in making repairs so that they won't break down."

Asked whether if he regarded \$16 a remunerative price when he was making rails, \$28 should be considered a remunerative price for the Steel Corporation, Mr. Carnegie replied: "It's a liberal price. I merely told my experience. I don't care to be a critic of my successors. I was in business to make money. I was not a philanthropist then. When rails were high I took the best price I could get. When they were low I took what we could."

Maximum Price Fixing by Government

In reply to a question as to whether he thought the stage had been reached where it is necessary for the Federal Government to come in and fix maximum prices, Mr. Carnegie said: "I think the time has arrived when that is absolutely necessary. I point to the Interstate Commerce Commission, which has brought peace and order out of chaos in the railroad world. Consumers are absolutely at the mercy of these corporations."

Asked whether he would apply his policy of Federal price-fixing to purchase as well as sale prices, Mr. Carnegie said occasions would have to be met as they arose. They would not fix the price of labor federally, because "the man who provides for his own day and generation is wise." Answering a suggestion that the plan for federally fixing prices would be "a step toward socialism," he said: "Socialism has no terrors for me, I have such faith in human nature. Everything is getting better. There's greater distribution of wealth. Changing conditions have only for a time given these leaders great advantage. We are beginning to remedy all that. By your Federal Commission watching these corporations you will change those conditions. There are over 150,000 stockholders in the Steel Corporation. Can you name me any manufacturing company of 50 years ago that had 150,000 stockholders? Isn't that a distribution of wealth?"

Dissolution of Steel Corporation Would Not Cheapen Prices

Asked if dissolution of the Steel Corporation, under present conditions, would lessen the cost of steel products to the people, Mr. Carnegie replied in the negative. He thought the establishment of a government commission to regulate the conduct of industrial corporations would result in lower prices to the consumer. "If you break up these big combinations they will be driven to operate as separate companies, to regulate prices and output by agreement. The consumer, under such circumstances, would not be the gainer in the long run. That is my opinion. All competition is destructive. Competition means strife. Unless a manufacturer can turn out goods at somewhere near the cost of his competitor he should go out of business. I would have a government commission fix a maximum price based on the cost of the most efficient manufacturer."

Mr. Stanley brought out that Capt. William R. Jones was opposed to men working more than eight hours a day, believing that in fairness to labor and with a view to gaining greater efficiency the men should not be worked on shifts longer than eight hours in the 24. Mr. Stanley stated that it was his intention to show later that hours of labor are increasing in the steel trade, and that the Carnegies really believed in a 12-hour day. "We tried eight hours with the men on the blast furnaces, but the men objected because they lost wages by it," said Mr. Carnegie.

An Industrial Court Proposed

Mr. Carnegie presented to the committee his plan for regulating large corporations as follows:

"I assume that it may be laid down as an axiom that where practical monopoly exists through combination in any industrial field or in any natural product regulation under the law must follow, to avert the grave danger of extortion from the consumer. How this is to be best guarded against in the easiest and least objectionable yet efficient form is the question. We are in a transition stage and naturally suggestions are numerous and diverse for effective compliance with the Sherman act as interpreted by the Supreme Court. That a satisfactory measure will finally be evolved is certain; one which does not go further than is actually necessary to prevent restraint of trade and monopoly. While these, to me, unendurable evils should be prevented, Government and courts may well rest from further action until experience dictates such modifications, if any, as may be necessary. There is no cause at present for either alarm or haste upon the part of the courts, Congress, or producers or consumers, whose interests will become mutual wherever freedom of trade and freedom from monopoly are established, because restraint of trade and monopoly restrict national prosperity, upon which labor and capital depend. Nothing revolutionary is required. Experience will reveal the true path as we march upward."

"There should promptly be created an industrial court modeled after the Interstate Commerce Commission and Court of Commerce, charged with all questions connected with manufacture and natural products, since the Interstate Commerce Commission is already fully occupied with its own field, but as the Commerce Court is not kept busy, with appeals, it might be the court of appeal for the Industrial Court as well as for the Interstate Commerce Commission. To prove the pressing necessity for the two

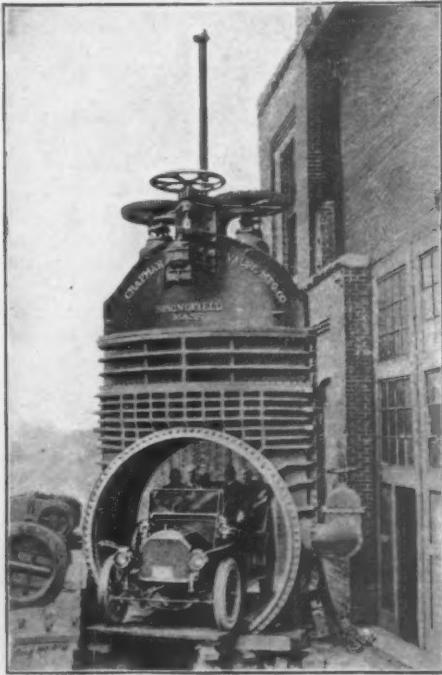
judicial organizations already formed in contrast to the Supreme Court which waited several years before an important issue came before it, the Interstate Commerce Commission has already sat in judgment upon the greatest of all organizations, the Pennsylvania Railroad. It asked to be permitted to advance its rate in one department. After investigation the reply in the negative was promptly accepted by the suitor—no appeal taken—who thus set all companies an excellent example.

"It is far from being of the first importance to punish men in this age who in the past formed pools and divided orders according to the capacity of their works or capital invested, or violated recent laws without knowing it. Men of the highest standing in the past thought they did no wrong and sought no concealment. The producer then did not imagine he was a wrongdoer. He followed recognized custom, and even railroad officials who, fighting in their day for the respective companies, urged that they only met the prices of competitors were somewhat in the same position.

"Since the Sherman law has been so far interpreted by the Supreme Court all this is changed. No honest man can now do some things which he did innocently before, but just what he can and cannot do is yet to be clearly defined. It is, however, not punishment for the past, but obedience in the future to clearly defined law, which our railroad system now enjoys. To this consummation, so devoutly to be wished, I earnestly hope your committee is to prove one of the chief contributors."

Large Electrically Operated Valves

Recently the Chapman Valve Mfg. Company, Indian Orchard, Mass., received an order for two large electrically-operated valves from the Ontario Power Company, Niagara Falls, Canada. These valves are the same style as three which were ordered some little time ago and will be used to control the water supplied to the 12,000-hp. hydraulic turbines in-



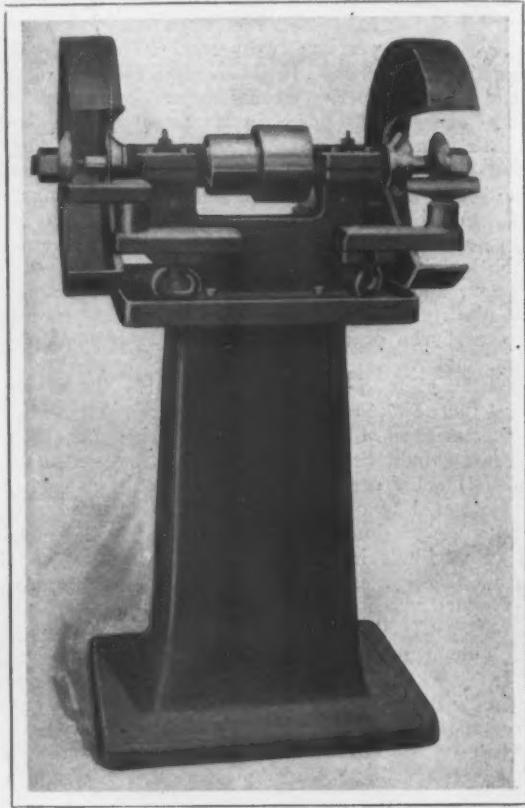
One of Five Large Valves with Distant Control Supplied to the Ontario Power Company by the Chapman Valve Mfg. Company, Indian Orchard, Mass.

stalled at the latter company's plant. These valves will be operated by a 15-hp. motor and are controlled from a distant station. Approximately 3 min. is consumed in opening or shutting the gate and during this period the motion is automatically controlled. In use the valves will be subjected to a pressure of 60 lb. per sq. in., or a total load of 275 tons on the steel gate. Some idea of the size of the valve can be gathered from the accompanying illustration which shows a seven-passenger touring car being driven through the 9-ft. waterway. The over-all dimensions of the

valve are height, 30 ft. 3 in. and width, 11 ft. The weight of the complete valves is 13,000 lb. At the present time these valves are rapidly nearing completion and will be shipped to the power plant in the very near future.

Grinder for Wheel Guards

The J. G. Blount Company, Everett, Mass., has recently brought out a line of wheel guards which are intended for use with its line of dry grinding machines. These



A Floor Grinding Machine Equipped with the New Type of Wheel Guard Made by the J. G. Blount Company, Everett, Mass.

guards are made in seven sizes and are mounted on the back of the grinder head. An adjustment to take care of the wear of the wheels has been provided.

With the close of 1911 one of the Federal courts, which has had an honored career, lasting 122 years, 3 months and 7 days, passed out of existence. In accordance with the judiciary act signed by President Taft on March 3, the circuit courts of the United States have been abolished, and from January 1, 1912, the ordinary Federal courts consist of the District Court, the Circuit Court of Appeals and the Supreme Court of the United States. The abolition of the circuit courts was decided upon to put an end to the confusion and overlapping that existed between them and the district courts. According to the strict law they had concurrent jurisdiction.

The M. Rumely Company, La Porte, Ind., has purchased the American Abell Company, Toronto, Canada, for \$2,000,000. The Abell Company manufactures agricultural implements and its customers are mostly in the prairie provinces, where it has an extensive sales organization which the Rumely Company will use for United States products. The Toronto plant will continue to be operated under the present name, but its capacity will be doubled. New officers have been elected for the company as follows: President, J. J. Rumely; treasurer, E. A. Rumely; secretary, T. A. Rowan; manager, T. A. Drummond.

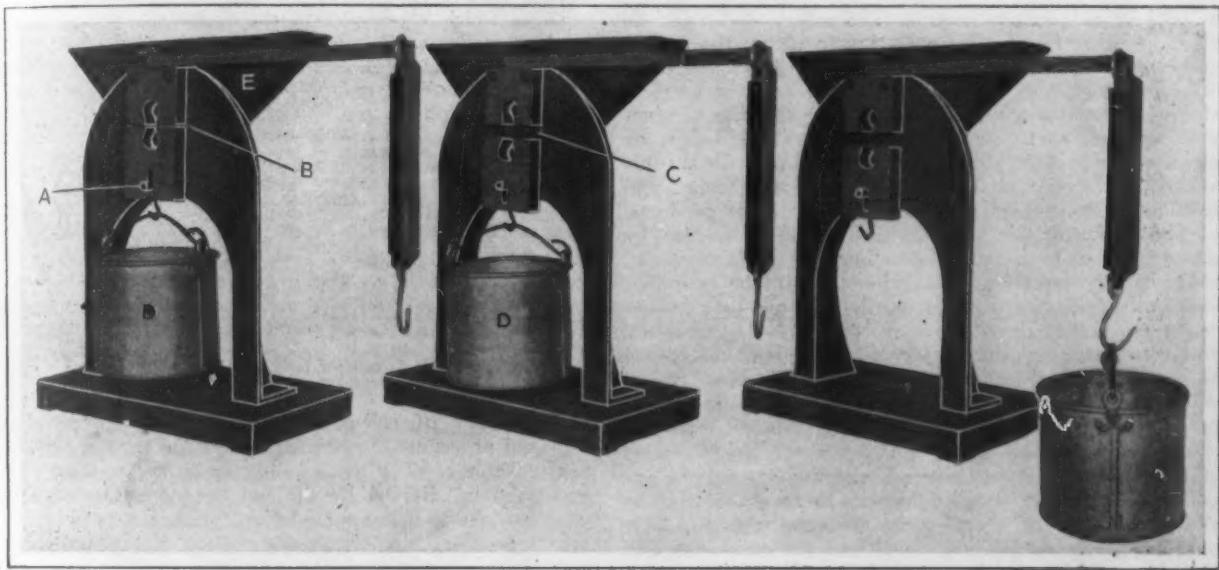
The report that the Erie Engine Company, Erie, Pa., will erect a large new power plant is untrue. The company states that no extension of its present plant is contemplated.

The Wadsworth Core Tester

Some five years ago George H. Wadsworth began a series of experiments on core mixtures to determine the comparative strengths of the various binders as well as the strengths of different core mixtures as affected by changes in sand, oil and binders. In this work Mr. Wadsworth was assisted by H. M. Lane, but on account of the lack of equipment for making accurate determinations the work was dropped for the time. During the past year the work has again been taken up and a number of manufacturers have combined to carry out the work. During the experimental work a number of different methods of testing the cores were tried, the choice lying between a tension and a transverse test. With very strong cores, such as the oil sand mixtures used for radiators, some classes of fitting cores, gas stove burners, etc., the transverse test on a 1-in. square core, 15 in. long, gave fair results, but it was difficult to turn out these large cores in quantities without rods and be sure that they would be free from mechanical de-

are removed from the jaws, the shot poured back into the hopper, another core inserted and the process repeated. In operation the machine is said to be very rapid, it being possible to test at least two cores per minute with ordinary mixtures.

The use of this machine is to test a new lot of sand or binder, two batches of core being made from the same sand, one with the old binder and the other with the new. These cores are then baked on the same plate in alternate rows and after being cooled are placed in the testing machine. The baking temperature will have considerable effect on the strength of the core, but as it will be the same for both samples an exact comparison of the strength of the two binders is possible. As variations in the clay content of the sand and the amount of dirt in the sand and the shape and size of the sand grains may have a marked effect on the strength of the core, every new lot of sand can be tested. The cores are made from the new and the old sand with a standard binder and both sets tested in the regular way.



Three Views of a New Core Tester Built by the Wadsworth Core Machine & Equipment Company, Akron, Ohio

fect which impaired the strength, while an additional objection was that the transverse test was not delicate enough to give a comparison between mixtures of approximately the same strength. An ordinary Fairbanks cement testing machine was first employed for making the tension test and while this was excellent for very strong core mixtures it was not delicate enough for the lighter ones that are commonly found in grey iron, brass and malleable foundries. To provide a satisfactory machine for this class of work the Wadsworth Core Machine & Equipment Company, Akron, Ohio, has developed a new core testing machine.

The core tested has the same shape as an ordinary concrete briquette, with an area of 1 sq. in. in the center. This core is placed between the jaws of the machine when they are in the position shown at the left of the engraving, the jaws being close together as shown in B. In this portion of the engraving, however, the core is not shown in place. The pail D is hung to the lower jaw so that it is supported by the core. The shot hopper E is filled with shot and by raising the pin A to the top of the slot in the jaw a small gate at the bottom of the hopper is opened and shot is allowed to flow into the pail. As soon as the weight of the shot in the pail is sufficient to break the core the jaws separate as shown at C in the central portion of the engraving. When the lower jaw descends it carries with it the pin A, thus automatically closing the shot valve. The jaw, however, is so arranged that it and the pail remain supported upon the pin without coming in contact with the base of the machine. The pail is then lifted off and hung on the spring balance which is shown at the right of the engraving. To get the weight which is needed to break the core the lower jaw of the machine or a weight equivalent to it must be placed in the pail. As soon as the reading has been taken the pieces of the core

It is also possible to secure a check on the regular running of the foundry by having one or two plates of test cores made from the regular mixtures and baked with the regular cores. If the ovens are not being run at the proper temperature the test cores will not develop the strength they should and this gives the core room foreman an absolute check upon the oven firing and the making of the core mixtures.

Large Coke Shipments to Canada

In the year recently closed the brokerage firm of J. K. Dimmick & Co., of Philadelphia, Uniontown and Cleveland, shipped a very great quantity of coke from the Connellsville region of Pennsylvania to the Crow's Nest Pass district of British Columbia and Alberta. The firm sent a representative to that district and secured the business of all the smelters during the time of the prevalence of the great strike among the coal miners, which began in April and continued until October. The coke was shipped by rail to ports on Lake Erie, then by water to Duluth, Superior and Ft. William; thence to destination by rail. Shipments were sometimes as high as 15,000 tons a week, and the business went to Connellsville coke producers at a time when their furnace coke trade was at its worst. This was an occasion when a sales agency proved to be of some benefit to the coke region. Dimmick & Co. were obliged to prepay the freight on shipments to the head of the Lakes, which took considerable capital, as 100,000 tons of coke shipped to that point would tie up practically \$500,000.

Another jobbing mill has been placed in operation at Gary, Ind., by the American Sheet & Tin Plate Company. Nine sheet and jobbing mills are now finished, and 13 more are nearing completion.

Distributing the Works Expense Burden

How a Factory May Be Divided by Imaginary Lines Into Productive Units Each to Earn Its Interest and Other Charges

In a paper calculated to blast the theory that the ratio of so-called non-productive to productive items of manufacturing expense is any clear guide to the cost of factory operation, Sterling H. Bunnell, at the annual meeting of the American Society of Mechanical Engineers, presented a lucid explanation of a scheme of arriving at true factory costs. The main features of the plan are as follows:

Absurdity of Minimizing Indirect Expense Ratio

The original conception of burden treated it as a wholly unfortunate, objectionable and regrettable outlay, to be kept as small as possible and subtracted from the gross profit of the factory operation to obtain the figures of net profit. Every possible effort was made to charge not only wages and material, but also repairs and supervision, in some way or other into the particular product that happened to be under construction. The residue of expense which could not be disposed of arbitrarily by this method was collected into a single expense account and distributed by proportion over the cost of the products.

The basis of this scheme of distributing burden by scattering it as evenly as possible over everything in sight, is the wholly erroneous conception that all the operating expenses of the factory can be divided into two classes, productive and non-productive, the first including all useful work on the manufactures to be sold later, and the second all waste, a dead loss to the organization. The logical development of the theory teaches that the ratio of non-productive to productive expense should be kept as low as possible; the best manager is he whose expense ratio is the lowest; and increase of expense ratio by high-powered machinery, trained helpers to save the time of skilled workers, and liberal outlay for good tools and their upkeep, causes loss. The absurdity of the conclusion and therefore of the premise, is evident. No legitimate expense is truly non-productive and some other definition must be found for the expense burden in order to indicate its true significance.

The ratio of indirect to direct expense is no indication of the efficiency of the management, except as between two precisely similar operations. In fact, a high ratio of direct to indirect may indicate extreme inefficiency, exactly the opposite of the accepted belief, and this under widely differing conditions; for instance, with a badly managed shop where every man charges his full time direct to a product, and runs his own errands or serves as his neighbor's helper on occasion; or, on the other hand, with a factory equipped with automatic machines under the care of skilled men whose time is charged direct to the cost of product. High indirect and low direct costs are to be expected with modern equipment, even without scientific management. Heavy cuts by a powerful machine tool in charge of an efficient semi-skilled man at usual day wages often involve an operating cost of \$1 per hour for the machine (an item of the expense account) against a direct wages cost of 30 cents for the man, a ratio of 330 per cent.

The works manager cannot wait twelve months for an annual audit to show whether a new planning department has saved its cost, or increased operating expense has been followed by a greater increase in value of output. The exact result of each new task-setting operation, change in method and improvement in equipment, not only in regard to the wages and supplies of to-day, but also with respect to the operating expense accounts of the month and the fixed charges of the year, should be known in detail and at once.

Dividing a Factory into Productive Units

Of the items which go to make up indirect expense or factory burden, some of them are observed to have a very clear incidence upon definite points within the factory.

Consider the annual interest on the value of a factory building. It will not rise with an increase in wages or cost of material; nor with an increase in output; nor does it concern anything which takes place in some other building. The building is there to serve a useful purpose; and whatever benefits by that purpose should pay its share toward the interest on the cost of the building. The purpose is evidently the housing of machines and their operators, each of which machines forms a unit in the productive scheme of the factory. Let the building be divided accordingly (by imaginary lines) into productive units, and require each to earn the interest on that part of the whole building which is occupied by the equipment, operator and work in progress, of the unit.

Table 1—Schedule of Expenses*

Interest on Land and Building	\$50.00	Interest on Equipment 5 per cent on half new value	\$168.25
Depreciation 2½ per cent on \$1,000 Valuation	25.00	Depreciation per schedule	407.00
Taxes, 1 per cent on \$1,000	10.00	Taxes, 1 per cent on assessment	39.00
Insurance, per year	5.00	Insurance	35.00
Heat and Light, Share of this Building	50.00		
Building repairs estimated at	25.00	Total to Distribute to Equipment	\$649.25
		Total Building Charge	\$165.00

*A unit value of \$1,000 for land and building and a new cost of \$6,620 for equipment are taken as a basis for these estimates.

The labor of calculation is reduced by following a standard procedure, commencing with the schedule of expense, Table I. The items belonging to the land are first grouped, and divided by the number of square feet of occupied land to obtain a land factor in dollars per year per square foot of land. Next, the portion of land belonging to each building is tabulated, and the area of each portion in square feet is multiplied by the land factor to give the total land charge for each building. This forms the first element of burden for the building. The interest, taxes and insurance are calculated on the book value of the building; the annual cost of heat and light are computed and the items totaled to obtain the annual building factor, and divided by the floor area of the building to give the square foot factor.

The next step is a map or diagram showing each production center with its working floor space, including in the list of centers erecting floor spaces, benches and all equipment on which men are employed or operations performed on factory product. The centers are then to be tabulated in order by departments with the appraised value and square feet of floor space occupied by each. Multiplying the latter by the square foot factor, the total building factor of each productive unit is obtained.

Apportioning Cost of General Machinery

Accessory equipment goes with the producing machine of each production center, that is, shafting, belts, all or a share of a motor, small tool equipment, and the like. The value of such equipment is generally much less than the value of the principal machine, so that absolute accuracy in apportioning accessories is not essential. If the value is very small it may be divided among the units in proportion to the value of their producing machines; if large, shafting and belts may be apportioned to the units on the basis of the floor space occupied by each, motors driving groups on the basis of the working horsepower-hours of each productive unit, and small tools by judgment. If the greatest accuracy is desired, the accessories may be treated separately and each one measured, appraised and assigned to the productive units accordingly.

The remaining calculations are carried out for each unit independently, including the value of the accessories with that of the main machine. A depreciation rate is

set for each unit, or class of machines, and the corresponding annual charge is computed. Interest on the value of the machine, taxes and insurance are also provided for. All these are definite quantities, not open to argument. There remain certain items not so definite: power cost, repairs, general labor, factory supplies and (in a machine shop) cost of tools, each of which requires special treatment. Power, if it could be metered separately to each productive unit, would become a direct charge; but as this is impracticable, and the power cost is not of the greatest magnitude, a reasonable approximation can be made by estimating the average power consumption, the average running time, and so the average annual horsepower-hours of each unit, and multiplying by the cost of a horsepower-hour to obtain the power factor of the burden charge. Supplies and general labor are best divided by estimate and judgment.

Apportioning Cost of Repairs

Repairs to the individual units cannot possibly be foretold; but the average total repair cost of the plant, or even of the several departments of the plant, can be estimated with some degree of precision, and distributed to the productive units in any of several ways. Perhaps the most practicable is to set by estimate figures representing the probable proportion of repairs likely to be required by each kind of machines, placing 1 opposite the machine likely to require the least expense for upkeep, 2 for those machines likely to require twice as much expense, and so on. By adding these figures for a denominator and using each figure separately for a numerator, the total estimate for repairs can be divided up among the several units. There is no advantage for cost-keeping purposes in attempting to charge the actual cost of repairs into the operating expense of each unit. In repairs for lighting and the like, which generally strikes without warning, there is no reason why the expense burden and therefore the cost of work done by one of several similar machines should be temporarily increased merely because that machine suffered breakage and was repaired at this particular time. Standard power and repair costs are a great help in rational cost-keeping, since they minimize fluctuations in cost not due to difference in management. By opening separate repair accounts, charging these accounts with actual cost, with all its momentary variations, and crediting the standard estimates, the varying balances tell an interesting story of the work of the repair gang, and keep the fluctuating costs of repairs from exerting a disturbing influence on the cost of product. A power-plant account similarly operated is also very useful.

Accounting for Idle Working Periods

The tabulation now includes subdivisions of all the expenses which go to make up the factory burden, up to the point at which the completed goods leave the factory, but exclusive of the administrative expense. If the total burden chargeable to each unit is divided by the respective annual working hours of the units running full time, an hourly rate for each productive unit will be obtained, which if applied to the cost of the work done by each unit, will in a normal year of full working time accumulate a credit which will balance the shop expense burden. There are, however, many lost hours in the course of the working year and such losses reduce the credit which is to stand against the annual shop burden, and tend to produce a deficit. Short time may be due to any of three causes, each of which gives to the resulting deficit a different significance. In the ordinary operation of a factory time is lost by the productive units through illness of operatives, changes in the force, breakages and repairs, and lack of capacity in other units. Obviously, a deficit in the credit against burden due to losses of this character is a manufacturing expense, and should be distributed to the cost of work.

Lost working time, however, may be due to sales department conditions, as when machinery is installed for the manufacture of goods which have a seasonable demand, so that they can be sold during only part of the calendar year. A deficit due to lost time of this character is selling expense, and not part of manufacturing cost. In such a case the sales department undertakes to earn through

profit on the sales the necessary amount to pay for the use of the capital invested in the equipment over the period of idleness. The manufacturing cost cannot be increased merely because consumption ceases after a time, so that the machines have to be stopped. If it costs \$1,000 to operate equipment for three months, and another \$1,000 for the following three months, it is not to be supposed that it costs \$2,000 to operate for the first three months only. Factory product can be made continuously, stocked up during an idle period, and sold at the proper time; if such a course is inadvisable, by reason of tying up capital, or loss of interest on the money represented by stored goods, or risks taken, the expense of intermittent operation falls outside of the manufacturing account. Admittedly, someone must pay the fixed charges for each period of idleness; but the party liable in cases of the kind supposed, is not the works manager, who would be glad to operate continuously, but the selling division of the organization, which must take the consequences of sales conditions. Correct accounting practice will not justify the distribution of selling expense to goods before they are sold; wherefore, manufactured goods should not be placed in stock with a burden allowance which includes selling expense, though it is quite proper to include all other items of burden.

The third possibility of the deficit due to lost time is that it is a consequence of bad trade conditions. Lost time of this character is neither manufacturing nor selling expense, but a business loss which should be made up out of the profits of good years. Conservative management accumulates a surplus to give stability to the rate of distribution to the stockholders, by reserving a portion of the earnings of good years to be used in maintaining dividends in times of depression. With correct methods in distributing factory burden, the loss due to short time operation, usually buried out of sight among other expenses which have no relation to running time, is clearly shown, so that an appropriation may be made from the surplus account to carry the deficit of poor years by the extra earnings of good years.

The divisor used on the annual burden of each unit should therefore be less than the full annual shop hours at least by a suitable allowance for holidays and other lost time. In the case of a large special machine for which there is work only part of the time, the expected working hours only should be used as a divisor, for such a unit, to be profitable, must earn its annual charges in the running time which can be given it. Whenever conditions change so that such a unit can be operated a larger proportion of the time, the hourly charge should be accordingly reduced.

Providing for Administration Expense

There remain some items like salaries and office expense, the incidence of which cannot be traced to definite productive units. This class of expenses however, is incident to the operation of the factory as a whole. The larger productive units, with their greater capital value and heavier operating expense, involve a greater tax on the management and administration than the smaller units. The burden charges belonging to the units provide a very fair measure of the responsibility of the management in connection with each, and serve well as a basis of distribution of the overhead charges. It is proper, therefore, to express the overhead expense total as a percentage of the total burden distributed to all the productive centers together, and to raise the hourly rate of each unit by the same percentage. Thus, if \$100,000 is distributed to centers, and there is an undistributed overhead of \$10,000, the rates can be raised 10 per cent., which will provide for carrying the whole \$110,000.

Statistics of Mineral Products.—We are in receipt of a copy of the large sheet, with its comprehensive table giving the production of mineral products in the United States for the calendar years 1901 to 1910, issued by the United States Geological Survey, and prepared by Edward W. Parker, statistician in charge of mineral resources. According to this table, the total value of the mineral products of this country in 1910 was \$2,003,744,869, against \$1,886,772,843 in 1909. The record, however, was made in 1907, when the total value was \$2,071,613,741.

Combination Molding Machine

The most recent addition to the line of molding machines built by the E. Killing's Molding Machine Works, Davenport, Iowa, is a combined jarring, squeezing and stripping machine. This machine can also be used either as a combined jarring and squeezing machine, a separate jarring or squeezing machine, or as a split pattern machine. Fig. 1 is a view of the machine in its original position as a jarring, squeezing and stripping machine, while Fig. 2 shows the machine in position for squeezing the top sand of the mold and Fig. 3 illustrates the pattern being lifted from the mold.

In designing this machine the idea of the builder was

these are mounted on four roller bearing wheels so that excessive carrying of the mold from the machine is done away with.

Cleaning Water for Gas Washing The Method Employed at a Number of German Blast Furnace Plants

In all plants where wet cleaning is used for blast furnace gas the disposal of the water is a serious consideration. In Europe this water is generally allowed to settle and is used again. Arrangements to carry this out satisfactorily take up a great deal of valuable space, and efforts

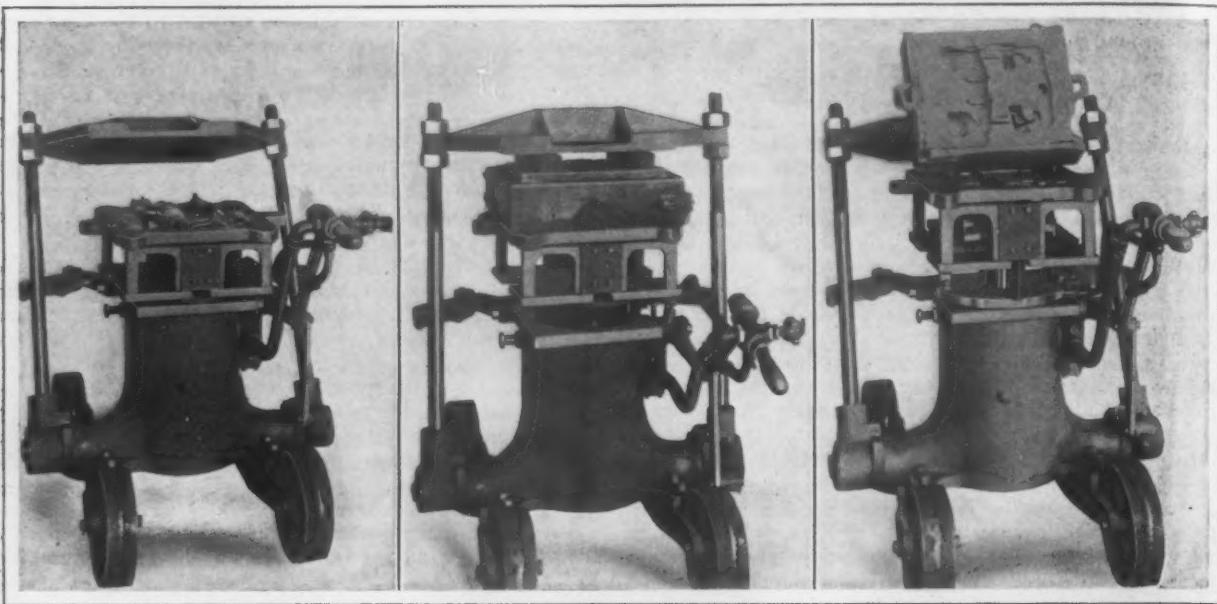


Fig. 1—The Original Position
Three Views of a New Combined Jarring, Squeezing and Stripping Molding Machine, Built by the E. Killing's Molding Machine Works, Davenport, Iowa

to produce a machine for light and medium heavy work. By applying the jarring process to this machine the tucking of bars by the operator is entirely avoided and the sand is uniformly packed around the pattern which is an important feature on the light castings such as stove plates and radiator parts. Another advantage is that the pattern and stripping plate outfit used on the hand ramming stripping plate machines can be mounted on this machine, thus saving time that is otherwise consumed by the hand ramming operation.

In Fig. 1 the machine is shown in its original position as a jarring, squeezing and stripping machine. The pressure block is pushed back and after the sand is poured into the flask, a simple turn of the valve handle at the right admits air to the jarring cylinder. A few quick blows are sufficient to pack the sand uniformly around the pattern and by bearing down on the valve handle the pressure block is brought forward and a simple turn of the valve handle will cause the top sand of the mold to be squeezed, the machine having assumed the position illustrated in Fig. 2. When the valve handle is lifted the pressure block returns to its original position, a spring gear absorbing the shock. By pulling a trigger valve air enters the small cylinder which is built into the squeezing cylinder and the piston will lift the stripping plate and the mold from the pattern, as shown in Fig. 3.

The automatic features and the performance of this machine are readily controlled by the operator so that it is pointed out that an inexperienced man can secure satisfactory results from it.

Two sizes of this machine are built at present and

have been made to improve the practice. *Stahl und Eisen* recently contained an illustrated article, written by Dr. E. Steuer, of Neustadt on the Haardt, giving an account of

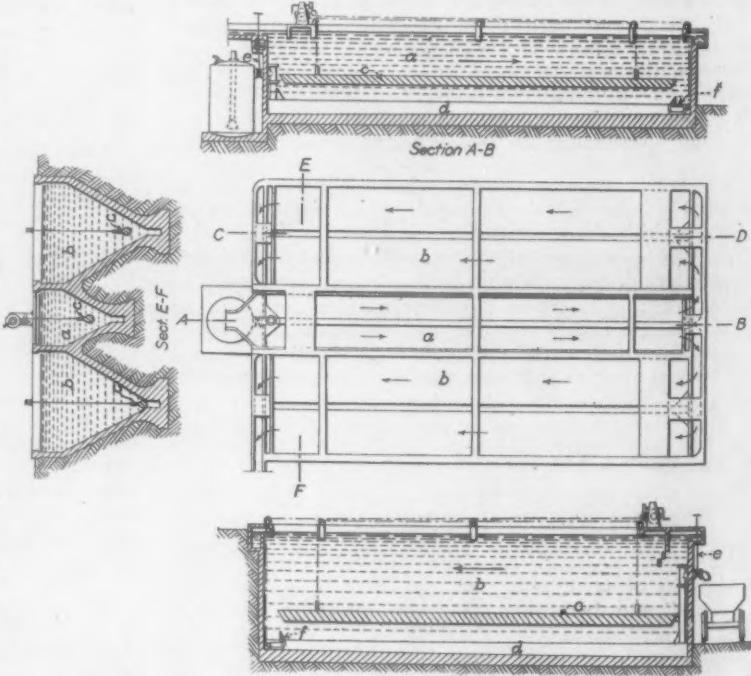


Fig. 1—Plan and Section of Water Cleaning Plant

greatly improved methods, which have resulted in much economy of space. An abstract of this article, dealing with installations at Aumetz Friede, Kneuttingen, and at Esch, on the Alzette, in the works of the Gelsenkirchen Company, is presented as follows:

The imperfections of the usual employment of settling basins are pointed out, and a special type of basin is described. In Fig. 1 is shown the arrangement of a plant recently installed. The dirty water from the purification plant flows first into the long basin *a* with such a velocity that only the heavier particles can settle. The water then enters two parallel basins *b*, through which it takes about 1½ or 2 hours to pass. The mud that settles to the bottom is removed from all the basins in the following way:

The sides, which are inclined at an angle of 60 deg., lead to a channel *d*, which gradually fills with mud, so that in time there is present a thick layer of comparatively water-free material, above which come layers of dirty water that finally end in clear water. A beam *c* is suspended above the channel *d* at about the height of the under side of the clear zone. From time to time it is lowered, and in this way the heaviest layer is practically separated from the material above, being only in contact at one end. This mud channel has a pipe outlet at the other end with a valve *e*. At the first end is a piston-like disk *f*. If the valve at *e* is opened this disc is forced forward, and constantly presses the mud in front of it, up the pipe and into either a car or a pressure cylinder.

In this simple way the gum-like mud is removed in a few seconds without the settling process being interfered with. The beam is raised, the piston disk brought back to its starting place, and a new period begins. The mud from the first basin contains from 40 to 50 per cent. iron, and can be kept separate from the valueless material from

The Burden Iron Company Not Extending

The Record, Troy, N. Y., published January 10 to the following statement by James A. Burden: "As president of the Burden Iron Company, I was very much astonished yesterday to see the announcement in the Troy papers that

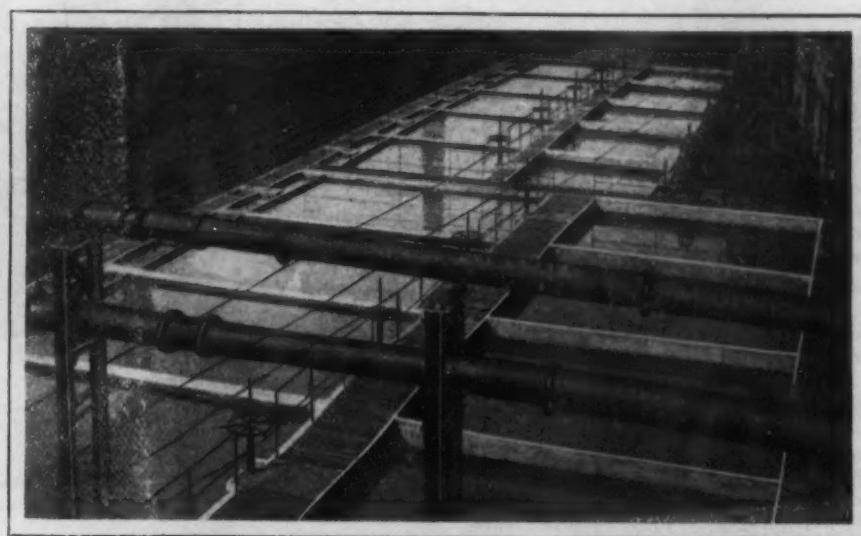


Fig. 2—Cleaning Plant at Aumetz Friede, Kneuttingen

the company contemplated large extensions to its plants. We do expect shortly to install a small electric plant to provide lighting facilities for the works, but beyond that we contemplate nothing new whatever. In the past two or three years the increase in the use of the motor car and motor truck has threatened the prosperity of the horse-shoe trade, and for that reason we have been searching for some new article to manufacture suitable to the peculiar conditions which surround the manufacture of iron

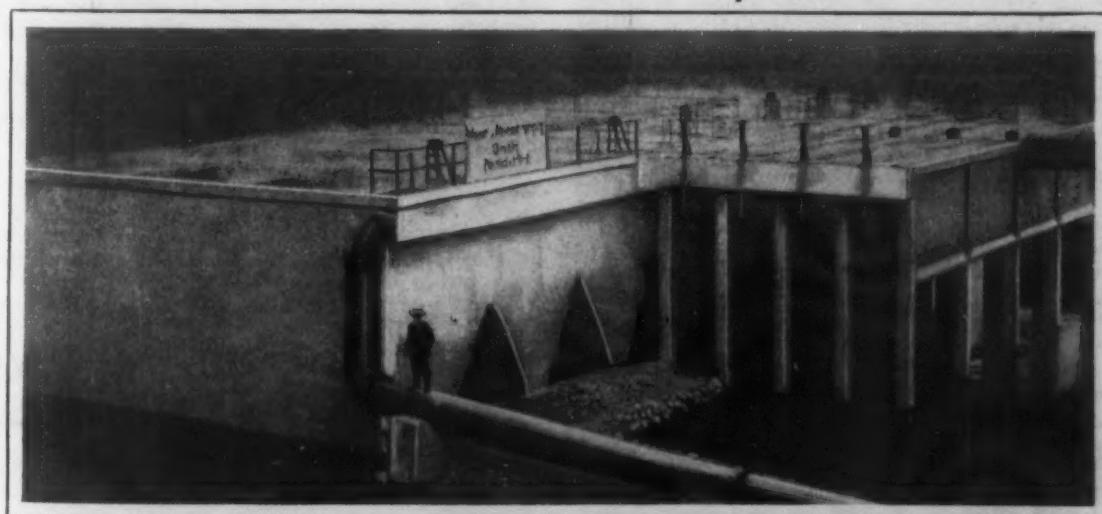


Fig. 3—Cleaning Plant at Esch, on the Alzette. Works of the Gelsenkirchen Company

the other basins. It is in very suitable shape for briquetting.

The patents for Germany and other countries are held by the Wasser und Abwasser-Reinigung G. m. b. H., located at Neustadt. The arrangement has already been installed at different blast furnace plants, of which views are given, and two of these are herewith reproduced. These plants have an hourly capacity of 24,720 to 63,560 cu. ft. of dirty water. Several other plants are in construction. The results so far obtained are very good, and certain technical improvements guarantee still better practice.

The arrangement occupies much less space than the old settling basins and is much more efficient. From 90 to 120 sq. yd. give an output of about 3530 cu. ft. of water ready for further use in the gas purification system. The economy of room frees valuable land for other purposes.

G. B. W.

and steel at Troy. This new article has not been found yet, and as the general condition of the iron and steel trade is at low ebb, we naturally contemplate no extension."

At a special meeting of the Metropolitan Section of the Society of Automobile Engineers, held at the Engineering Societies Building, 29 West Thirty-ninth street, New York, on the evening of January 12, the members of the American Society of Mechanical Engineers were its guests. At this meeting an address was made by Charles Y. Knight on the "Evolution of the Slide Valve Internal Combustion Engine." Mr. Knight is the inventor of the motor bearing his name which is being used so extensively in this year's automobiles. An illustrated description of one of these motors appeared in *The Iron Age*, August 10, 1911.

The Oeking Offset Frame Punch

The Wiener Machine Company, 50 Church street, New York City, has recently secured the selling agency for the United States, Canada and Cuba for the punching and shearing machinery built by the Oeking Company, Dusseldorf, Germany. The machine which is illustrated here-with is a somewhat novel combination, being a punching machine with offset frame and interchangeable shearing blade for splitting plates of any length or width. These machines are intended to meet the demand of many shops which cannot afford a special plate splitting machine and are said to be free from the limitation found in other machines of this character when fitted with splitting blades of having the size of plates handled limited by the depth of the throat. This machine combines two different tools in one frame without, it is stated, impairing the efficiency of either so that the purchaser has the advantage of saving in the price and floor space of one machine. Fig. 1 is a view of the machine arranged as a punch with a plain jaw, while Fig. 2 shows the machine arranged as a splitting shear with a device for separating the plate.

The frames, the face plates, the clutches and all other parts are made of a special grade of steel castings possessing high tensile strength, and the material is distributed so as to secure durability. All the shafts are forged of fine steel and run in long bearings, those of the driving shaft having bronze bushings while the others are provided with close grained cast-iron ones.

The machine can be driven either by a belt connection or a directly connected electric motor. With the belt drive tight and loose pulleys are employed and the driving belt can be run from any direction since the belt shifter can be turned around. With the motor drive a spur gear is attached to the flywheel and a rawhide pinion mounted on the motor armature, the pulleys having been removed and the motor mounted on the platform. The plungers are operated by clutches which act instantaneously and are automatically disengaged after each stroke. The punching machines can be engaged or disengaged at any point of the stroke by foot or by hand and if desired the machine can be operated continuously. By turning a hand wheel the punch can be lowered to ascertain the center mark and the punching done without the punch rising again.

This machine is equipped with a plain jaw as shown in Fig. 1 and is intended for the use of an overhanging die block so that it is possible to use these machines at any time for architectural or structural work, although they may not have been originally bought for this purpose. When equipped as a plate shear as shown in Fig. 2, the machine is provided with a spreading device to prevent the plate binding against the frame and facilitate feeding it into the machine. Other portions of the equipment are an indicator pin to follow the cutting line, and a hold-down which is adjustable both vertically and horizontally. The adjustment of this hold-down is easily made and the knives can be removed without taking off the stripper.

These machines are built in five sizes and the following

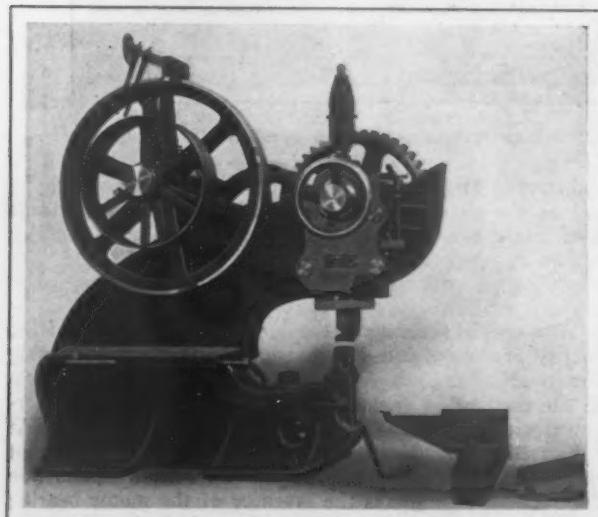


Fig. 1—A New Punch with Offset Frame Sold by the Wiener Machinery Company, New York City

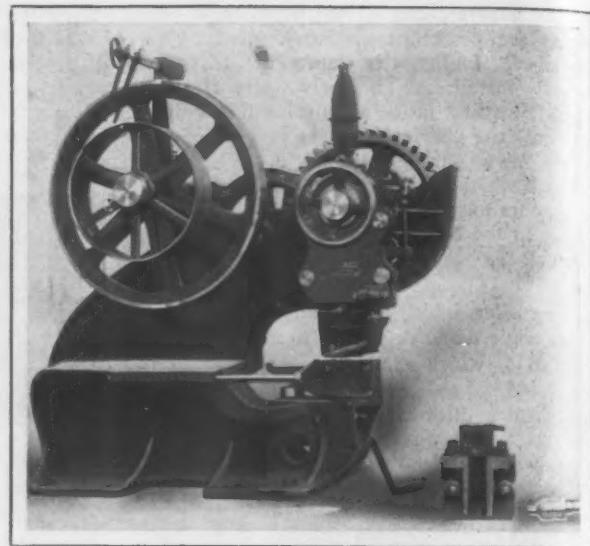


Fig. 2—The Machine Arranged as a Splitting Shear with Plate Spreading Device

table gives the principal dimensions and specifications of the different ones:

Size.	11	13	16	20	26
Depth of punch throat, in.....	11 3/8	13 3/8	16 1/8	19 3/8	24 1/2
Height of stroke, in.....	7/8	1	1 3/16	1 1/2	1 3/4
Diameter of hole punched, in.....	13/16	7/8	1	1 1/4	1 1/2
Thickness of material punched, in. 7/16	1/2	1/2	1/2	13/16	1
Length of plate shear knives, in. 7/16	8 1/4	9	11	14 1/4	
Thickness of plate handled, in. 7/16	1/2	1/2	1/2	13/16	1
Width of flat bars, cut, in.....	3 1/8	3 1/8	3 1/8	4	4
Thickness of flat bars cut, in.....	9/16	11/16	13/16	1 1/8	1 3/8
Largest angles cut, in.....	2 1/2	3	3 1/2	4	5
Largest T's cut, in.....	1 3/4	2	2 1/2	3	4
Largest rounds cut, in.....	11/16	13/16	1	1 1/4	1 1/2
Largest squares cut, in.....	9/16	5/8	7/8	1 1/8	1 1/8
Strokes per min.....	23	20	19	17	12
Power, hp.....	2	2 1/2	4	6	9
Speed, r.p.m.....	350	335	320	300	280
Diameter of driving pulley, in.....	15	18	19	20 1/2	26
Face width of driving pulley, in.....	2	3 3/4	3	4	5
Length, in.....	53	61	67	89	106
Width, in.....	36	41	51	55	63
Height, in.....	47	57	67	79	91
Approximate weight, lb.....	1,430	2,150	3,520	5,720	9,250

Unless specially ordered all standard machines are equipped with a plain die block. Special tools can be furnished for notching and coping the flanges of beams, channels, angles and T's; notching and mitering angles and T's; punching miters and coping T's, channels and Z bars. The punching machines can also be furnished with the builder's standard punches and dies and also with his circular stripper.

A Petition for Lower Rates on Southern Pig Iron

It is announced that the Southern producers of pig iron who have for some time been negotiating with the railroads for a reduction in the freight rates on pig iron to points north of the Ohio River will carry their case to the Interstate Commerce Commission. The petition is now being drawn. The contention of the furnace companies is that the present rates, which are represented by a charge of \$3.25 from Birmingham to Cincinnati, are generally \$1 a ton above those which existed in the late nineties. The advance was justified by the railroads in view of the price obtained for Southern pig iron, the last advance of 50 cents becoming effective when No. 2 was selling at \$20 at furnace. The shippers contend that since the \$3.25 Cincinnati rate was based on pig iron prices around \$20, Birmingham, the present price of \$10, Birmingham, calls for a very considerable reduction. The complaining companies include the Woodward Iron Company, Republic Iron & Steel Company, Southern Iron & Steel Company, Sloss Sheffield Steel & Iron Company, Birmingham Coal & Iron Company, and the Alabama Consolidated Coal & Iron Company. It is stated on behalf of the complainants that their contention is supported by consumers of pig iron in the Chicago district, who allege that on account of the high freights they are unable to buy Southern iron for their mixtures. New England foundrymen also sympathize.

The Government Workshop Labor Inquiry

WASHINGTON, D. C., January 15, 1912.—The special committee of the House of Representatives, which was appointed to investigate the Taylor and other systems of shop management in the Government factories, is now giving hearings in Washington and has still much further work to do before rendering its final report on March 10 next and must before that day hold sessions in Philadelphia and elsewhere.

The attitude of the workmen in the arsenals, speaking generally, has been one of fear lest any efficiency system, such as is proposed, may be used to "speed up" the workmen so that a severer strain may be put upon them than their health can permanently stand while the increased wage which they admit seems to accompany the system may, later, be cut off while the high speed work is still demanded and so, as one of the witnesses expressed it, "the workmen get it both going and coming."

The workmen say, substantially, that experience has shown that piece work has always been abused. They say further that whenever men have "let themselves out" under a piece work rate, so that their weekly wage was materially increased, the piece rates were at once reduced, often on the ground that the men were earning too much. The result has been that an increased output was secured, but at the cost of overstrain and excessive fatigue, which evil results often do not appear for several years. There is apparently, in the opinion of experts, much truth in these statements of experience.

On the other hand, it is claimed that the very nature of any scientific management system provides for obtaining such accurate data as will alone secure a sound foundation for a permanent price basis. It is urged that among the reasons for the piece rate cutting of the past has been the lack of current time standards; the want of definite knowledge of what time certain work really requires. The advocates of the efficiency systems who appeared before the committee in New York, embracing most of the leading so-called efficiency engineers, all agreed that it was an essential part of any such system that bonus or piece prices should be permanent so long as the character of the work remained unchanged; that a permanent price basis with an assured bonus is of the very essence of efficiency and that the cutting of rates is the very thing that scientific management seeks to avoid.

Against this it is asserted that any change of management may bring with it a change of method, and the new managers, if they think it will pay, may and will cut the rates and maintain the speed if they can, regardless of what their predecessors may have said. But, it is replied, this is equally true of day work or plain piece work; that there is and can be no guarantee of any fixed condition. Indeed, since the higher rate of the bonus worker is based on actual records of output and trained skill, the scientific managers say that such skill and record afford the worker a sounder basis for a permanent and higher wage than he has ever had. This is because he is the most economical producer, and the very selfishness of employers leads them to secure the men whose output costs the least, for men who are highly trained are always in demand. It is furthermore urged by the efficiency men that their methods for the first time recognize certain rights of the workers, namely:

1. Their right to share permanently, pro rata, in the increased output.
2. Their right to be furnished the best tools and equipment so that their output may be made of best quality and largest quantity.
3. Their rights to definite periods of rest.

These things, if true, and all the scientific management men claim them to be true, constitute, it is asserted, an important advance in the economic status of the American workers.

The committee will continue its hearings in Washington until Friday of this week, when an adjournment will be taken for 10 days in order that the several members may give attention to other matters that for the time being they have been compelled to neglect. The committee's next session will be held in Philadelphia.

J. G.

The Mining of Cuban Iron Ores

Operations of the Spanish-American Iron Company on the North and South Shores

(Illustrations on pages 206 and 207.)

A full description of the extensive plant operated on the north shore of Oriente Province, Cuba, by the Spanish-American Iron Company, in the mining and sintering of its Mayari iron ores, was given in *The Iron Age* of September 14, 1911. The article was the reproduction of a paper by James E. Little, of Steelton, Pa., prepared for the American Institute of Mining Engineers and published in the Bulletin of the Institute for August, 1911. Mr. Little described the general features of the mining and transportation systems, the operation of nodulizing in kilns located at Felton, the terminal of the company on Nipe Bay, and the provision and equipment for ore storage and loading. In a paper previously prepared for the American Institute of Mining Engineers by Dwight E. Woodbridge, Duluth, the exploration of the Spanish-American Iron Company's properties at Mayari was gone into at length, and in connection with the reprinting of Mr. Woodbridge's paper in *The Iron Age* of April 13, 1911, views were given showing the use of the drag line excavators at Mayari. It was then said that the advantages of the drag line excavator had been demonstrated where the deposit of ore was comparatively thin and the floor quite rough. It also had the advantage of a large radius of action. Where it is possible to get one or two full cuts in clean ore the steam shovel is plainly advantageous, and it is in use at the Mayari mines alongside of the drag line excavator.

On the next two pages are given three panoramic views, two of which illustrate strikingly the character and extent of the operations of the Spanish-American Iron Company in the Mayari field, while the other is an excellent view of the Daiquiri hematite mines of the company on the south coast of Oriente Province. Here the mining problem is entirely different from that presented by the Mayari deposits. The ore is quarried in benches, as shown. The mines at Daiquiri have proved reserves of about 3,000,000 tons and the ore is shipped to this country at the rate of 500,000 tons a year for use at Sparrows Point, Md., and Steelton, Pa.

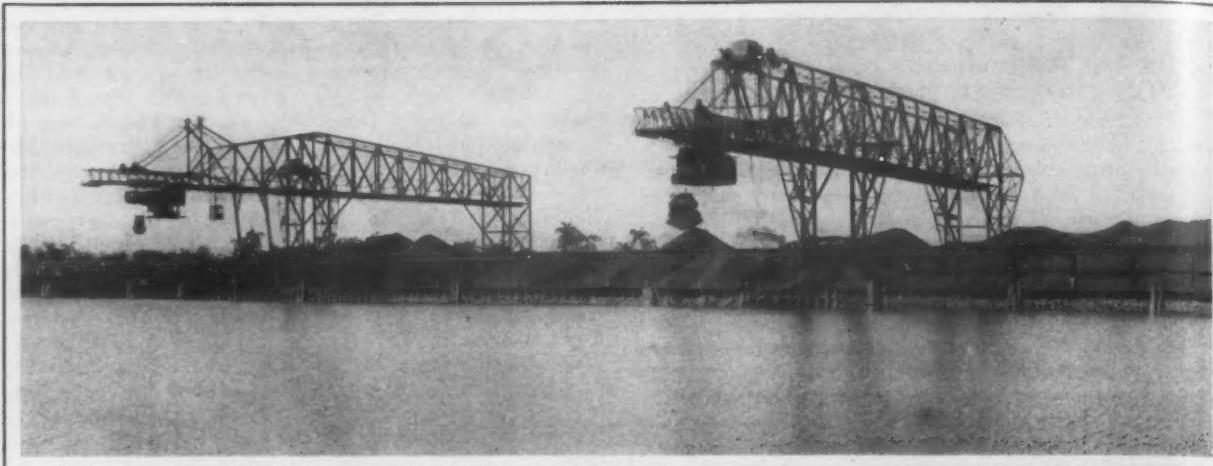
The Continental Supply Company

The Continental Supply Company has been chartered under the laws of Ohio, with a capital stock of \$1,000,000. Its object is to establish stores and warehouses in the various oil fields of this country and Mexico for the distribution of supplies to oil well drillers and contractors, such as tubular goods and fittings, engines, boilers, wire rope, cordage, drilling tools, gas engines, power pumps, etc. Arrangements have been made with the Youngstown Sheet & Tube Company for the sale of its full line of oil country tubular goods.

The executive headquarters of the company will be located at St. Louis, Mo., and the main office at Youngstown, Ohio. Stores and warehouses will be established at central points in the oil fields of Ohio, Pennsylvania, West Virginia, Illinois, Oklahoma, Texas, Louisiana and Mexico, and a full corps of store managers and field men experienced in this line of work has been arranged for. The directors are as follows: George E. Day, chairman; James A. Campbell, Richard Garlick, William E. Manning, Walter H. Adams, Sumner Merrick, Alfred G. Heggen, William K. Hughes and William R. Wilkinson, most of whom are connected with the Youngstown Sheet & Tube Company. Following are the officers: Sumner Merrick, president; Alfred G. Heggen, vice-president; Walter H. Adams, treasurer and assistant secretary; William R. Wilkinson, secretary; William K. Hughes, general sales manager.

Correction.—In the description of the heavy single-crank press built by the A. Garrison Foundry Company, Pittsburgh, Pa., which appeared in *The Iron Age*, January 11, the width of the bed was given as 48 in. This was a typographical error, and should have read the depth of the bed, the width being 36 in.

The Spanish-American Iron Company's Iron Mines in Mayari Ore



Loading Docks at Felton, on Nipe Bay. Nodulized Ore in Storage Yard (1000 ft. long) Ready to Be Loaded Into Vessels. The and Grab for Handling Ore; the Second, a 6-Ton Grab,

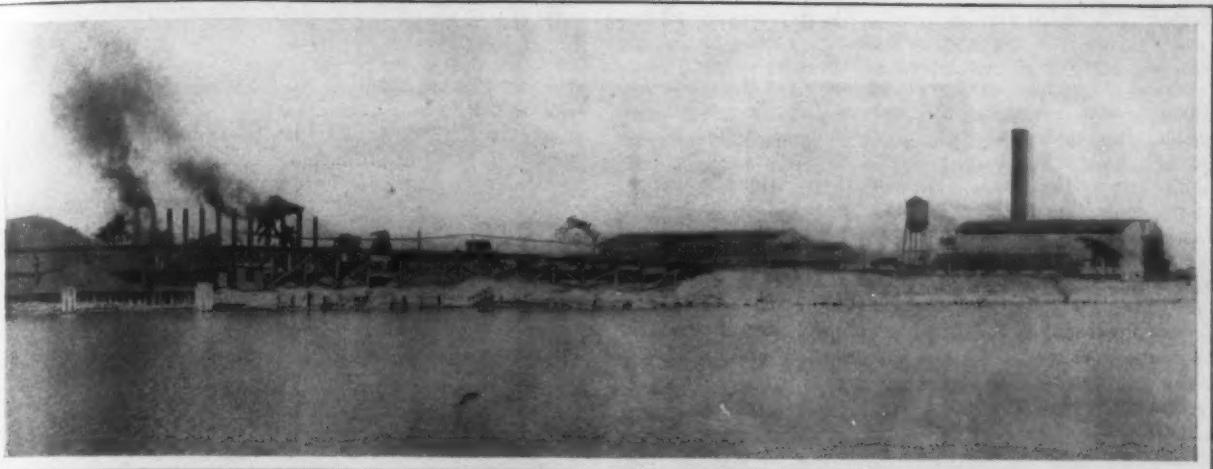


The Company's Iron Mines at Woodfred, near Mayari on the North Coast of Oriente Province, Cuba. Mining the Surface Brown Ore with



Hematite Mines at Daiquiri, on the South Coast of Oriente Province, Cuba. The Ore is Quarried in Benches. A Heavy

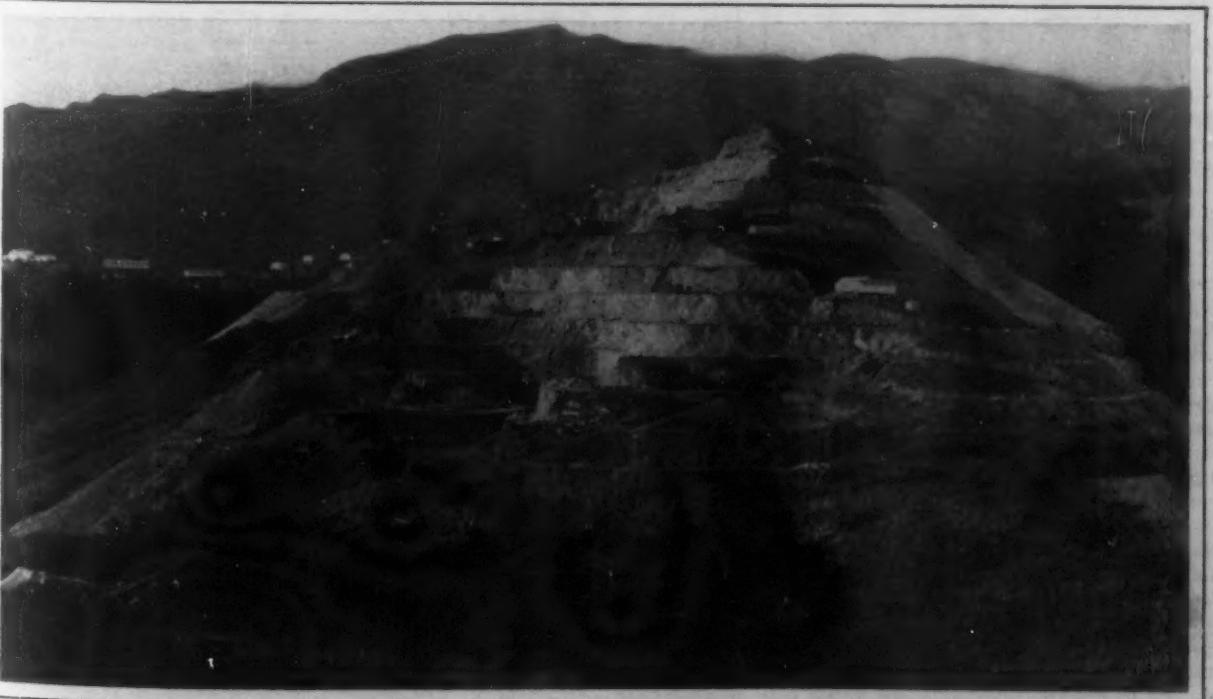
Cuba and the Loading Docks and Nodulizing Plant for on Nipe Bay



Yard, in Which is Stored Also the Coal for the Nodulizing Plant, Is Commanded by Two Ore Bridges, One Carrying a 15-Ton Trolley
Used for Unloading Coal and Also as an Auxiliary Ore Bridge



Steam Shovel and Drag Line Excavator. The Ore is Found at an Elevation of 2,000 ft. and Is Covered with a Growth of Pine Timber



Overburden of Rock is Removed by Steam Shovels, Fourteen Being in Operation on the Hill Shown in the View

Recovering Gas Engine Wastes

Development of a Marketable Apparatus for Utilizing the Waste Heat of the Exhaust Gases and Jacket Water

A development of commercial promise, in the making in quantity of a casting for assemblage after the manner that castings are united to form a horizontal sectional house-heating boiler, has been put on the market by the New York Engine Company, New York City, after the designs of the consulting engineer of the company, John L. Bogert. It is intended to utilize the heat of the jacket water and of the exhaust gases of the gas engine. The castings, which are provided with ribbed external surfaces, are mounted one above the other and the gases from the engine may follow a tortuous path around the castings and through the openings especially provided in them, also after the fashion of the common form of vertically mounted cast-iron heating boiler. The hot jacket water may be used as the feed to the water spaces of the sections. The assembled castings may be mounted in a suitable metal casing, and tests have shown that steam may be generated at 60 lb. pressure at the rate of $2\frac{1}{2}$ to 3 lb. per hour per brake horsepower of the gas engine, when the engine is operating at close to its rated capacity. The exhaust heat recovery boiler, as it is called, has had the advantage of practical use in the power house of the boiler shops of the New York Engine Company, at Watertown, N. Y., and the importance of the heater lies in its application as a boiler for power work or as a means for heating the buildings of the industrial plant equipped with a gas engine plant.

The accompanying illustrations show the application of the heater or boiler with the gas engine, and also the details of the structural features of the castings, and in addition a view of the installation in the company's Watertown plant. An important later provision has also been contrived by Mr. Bogert to allow for continuous use of the recovery boiler when the gas engine is not in operation, as during nights and holidays when steam may be needed or heating of the building may be required or desirable. This amounts to the provision of a furnace alongside the apparatus for burning coal. During the daytime the bed of fuel may be maintained in a quiet condition, and when the gas engine is shut down the draft of this furnace may be opened up and the products of combustion passed through the boiler in place of the gases of combustion from the engine.

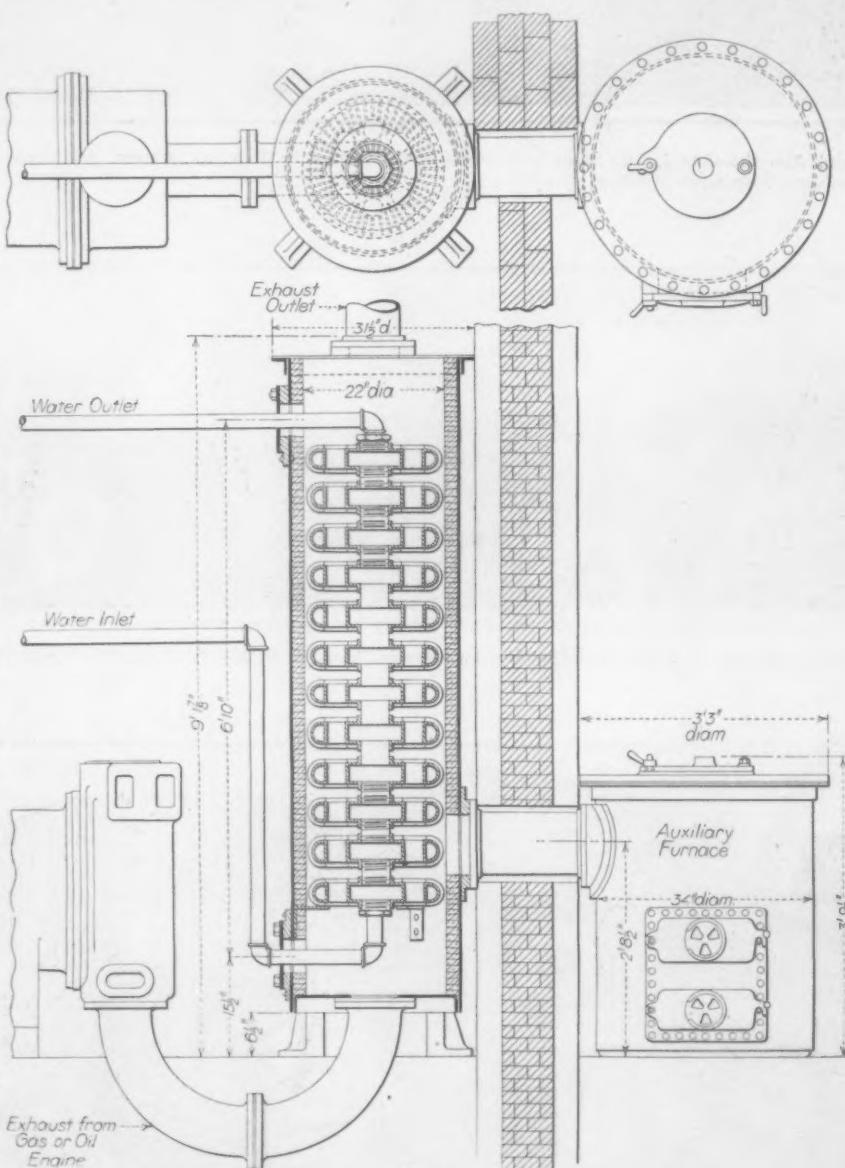
Among the points on which emphasis is placed is the relative small amount of space required by the boiler, as is indicated in the half tone illustration, and also the use of cast-iron, which has of course a high degree of resistance to corrosion. The outer shell or steel plate is lined with

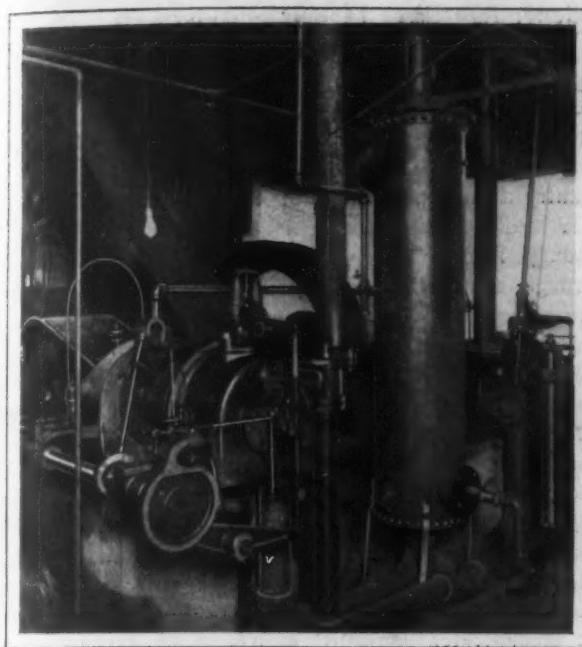
concrete or ordinary brick standing on ends. Another important phase of the construction is that the apparatus in its entirety acts as a muffler; the numerous short passages connect what are substantially expansion chambers so that the velocity of the gases may be gradually reduced without serious back pressure being developed. The installation pictured shows two 50 b.h.p. suction producer gas engines, exhausting through one heater. The jacket water is fed from the jackets of the engine into the top of the heater and passes out at the bottom. The hottest water thus exists where the gases are the hottest and the coolest water, where the gases are the coolest.

The twin engine shown is of 100 bhp. at 200 r.p.m. with an overload capacity of 15 to 20 per cent. The space occupied is 13x 11½ ft. The jacket water tem-

perature is raised from 65 to 130 deg. Fahr. in passing through the jacket. After it has passed through the exhaust heater its temperature is raised to 212 deg.

The Federal Furnace Company, Chicago, recently completed the relining of its A furnace at South Chicago. It also installed a new electric skip engine in place of the steam unit. The improvements in the past year also included the installation of a crane for use as a drop. Furnace A was last in blast in April, 1911.





A 100-b.h.p. Twin Gas Engine with Heat Recovery Boiler

The New Baldwin Locomotive Works in the Chicago District

Samuel M. Vauclain, vice-president of the Baldwin Locomotive Works, Philadelphia, confirms the report of the purchase by that company of 370 acres of land at Calumet in the East Chicago, Ill., district, for the site of a Western plant this company will build. The land is bounded by the joint right of way of the Pennsylvania and the Baltimore & Ohio, Chicago Terminal, and on the south by the Elgin, Joliet & Eastern, and the Chicago, Lake Shore & South Bend electric railroad. The site adjoins the western line of Gary. Concerning the proposed plant, Mr. Vauclain has written as follows:

As in the past our procedure will be conservative and the work which we have in contemplation at that point will progress as the business of the country may warrant. If the present depression in business should continue the progress will naturally be slow. If business should revive and works be called upon for their maximum capacity of output the progress would be most rapid.

It is our intention to start with the erection of shops to handle similar work which we now have located at Burnham and Eddystone, having a capacity of output of raw material sufficient for 10 modern locomotives of the largest type per week. As soon as these shops are finished and in working order so that raw material can be furnished, the finishing departments, the erection of suitable machine and erecting shops for the completion of 10 locomotives will be erected and put in operation. When this unit sufficient for the building of 10 engines is completed and in working order, which we hope will be at an early date, the shops should furnish employment to at least 5000 men. Our object in purchasing the 370 acres of ground is to provide room for the extension of our works by adding, as soon as suitable accommodations can be provided for workmen, transportation facilities developed, and as advantageous business offers, additional units of 10 engines each, until we finally will have completed a plant with a capacity of 30 finished locomotives weekly and the manufacture of all the forgings and castings entering therein, employing from 12,000 to 15,000 men, depending upon the development which the art may have attained at that time.

The Ellfeldt Hardware & Machinists' Supply Company has removed from 305 E. Twelfth street to 1219 McGee street, Kansas City, Mo., where it now occupies a three-story building. The rapid increase in its business compelled the engagement of larger quarters. The company carries a large stock of hardware specialties, fine tools and materials for machinists and mechanics in all branches.

The Philadelphia Foundry Foremen

At the regular monthly meeting of the Foundry Foremen's Association of Philadelphia, held on January 9, W. P. Cunningham of the Pencoyd Iron Works, gave an interesting address on "Some Experiences in the Manufacture of Semi-Steel." The work in question covered the making of some 400 castings, weighing from 125 to 1200 lb., cast in green sand molds. The castings were principally checker plates, and were subject to analytical and physical specifications. The mixture in the cupola was of selected pig iron and structural steel crop ends, the steel being charged directly on the coke bed. Forty-eight heats were made, and the gates and scrap were not recharged, but were collected and separate heats were run from them, making heavy castings for the company's use, not requiring any machine work. An average analysis of the semi-steel castings was as follows: Graphitic carbon, 2.80; combined carbon, 0.60; silicon, 1.35; manganese, 0.133; sulphur, 0.07; phosphorus, 0.10. The average tensile strength was 35,913 lb. per sq. in. The castings were of even grain and great strength. A discussion as to the general practice in making semi-steel as well as general gray iron castings followed.

Carlos Curtis Peek, superintendent of the Nelson Valve Company, Wyndmoor, Pa., and J. B. Carpenter, Wilmington, Del., representing the Buckeye Product Company, Cincinnati, Ohio, were elected to membership.

The Krupp-Midvale Suit Ended at Last

The suit of Fried. Krupp, of Germany, against the Midvale Steel Company, in which it is alleged that the latter had stolen certain Krupp patents used in the hardening of armor plate for battleships, was dismissed by the United States Supreme Court January 15, thus ending a fight that lasted for more than two years and a half. The complainant asked for \$2,000,000 damages.

The Krupp bill of particulars averred that spies placed in the Midvale works had brought information which proved that the Philadelphia company was using processes at no cost to itself, and which were the private property of Krupp. In addition it was declared that this infringement of the Krupp patents was the real reason for Midvale being able to underbid on armor plate for government battleships.

The Central Iron & Metal Company's New Yard

The Central Iron & Metal Company, wholesale dealer in scrap iron, metals and machinery, has removed to its new yard at Thirty-seventh and Rockwell streets, Chicago, where an entire block has been secured, providing a space of 182,000 sq. ft. The location is on the Chicago & Alton Railroad and the trackage in the yard is about 3500 ft. The company will now be in a position to handle any quantity and quality of scrap iron. It is installing a derrick, four shears and a railroad track scale. The old yard at Canal and Lumber streets will continue to be used as a storage yard. The office address is now 3650 South Rockwell street. B. Colitz is president and general manager and M. Perlman is secretary and treasurer.

Vanadium Ore in Arizona.—Much interest in mining circles of Arizona has been aroused over the announcement that a large body of vanadium ore was recently encountered in one of the lower levels of the Shamrock mine, situated near Casa Grande. The mine is owned by John Woolf and T. J. Meehan, of that place. While the extent of the vein has not been thoroughly determined it is stated that it shows every indication of being the largest body of vanadium ever discovered. Preparations are being made to develop it.

H. R. Stacks and John Johnson, formerly connected with the George V. Cresson Company, have formed a co-partnership under the name of Stacks & Johnson, with offices at 842 Drexel Building, Philadelphia, Pa., where they will engage in the general engineering business as well as maintain sales offices representing the Lehigh Crusher Company, Lehigh Clutch Company, and Catasauqua Castings Company, all of Catasauqua, Pa.

THE IRON AGE

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Independent Steel Makers and Exports

The independent steel companies of the country are investigating the possibilities of united action in the development of an export trade. Each of the seven larger companies in Central or Eastern territory, apart from the Steel Corporation, is now shipping out of the country a small percentage of its output each year, but nearly all of this business is done through domestic trading firms which have connections abroad, or through contracting or engineering companies whose operations at times extend to other countries. The independent steel companies, unlike the Steel Corporation, have no direct representation abroad, and hence none of them makes any consecutive or aggressive effort to get regularly a part of its business in the export trade. What is now proposed, and an early conference is expected to set the project on foot, is an organization of the independent steel companies which shall do for them substantially what the United States Steel Products Company does for the United States Steel Corporation subsidiaries. It will doubtless be an incorporated company, in which the various producing companies will take stock. If formed it will establish offices in other countries and compete for outside business through its own direct representatives.

Many questions will arise in connection with the launching of such an enterprise, but none of them appears now to raise any serious obstacle to the plan. The ideal arrangement would be a union of companies which were non-competitive, each having its own line of product which it desired to have pushed in the foreign field. But out of the seven companies referred to there would be two or three, and in some cases four, producers of a single form of finished material. The procedure would naturally be that the various companies represented would bid for business taken by the export company, and those not participating in the tonnage would at least participate in any profit the business might bring to the joint company. There would be more difficulties in the case of such a co-operative export company, particularly where closely competitive prices were named on a particular contract, when a descent was made to the "fighting cost" line, than could arise in the case of an integrated company like the Steel Corporation, but they are probably not insuperable.

That there would be any legal obstacle to such a form of co-operation is not considered probable by its promoters. The relation of the various companies as competitors for domestic trade would not be changed, and the object sought would be in no sense restraint of trade but rather the promotion of trade. Some practical questions would come up, including that of concessions in freight rates on shipments from mill to seaboard—a concession already in effect. There might also come up the question of special freight rates on the assembling of raw materials for the production of such steel as is shipped into the export trade. The continued attentions may be expected, also, of that class of economists who demand that the lowest price made on product sent half way around the globe, to compete with foreign mills having but a fraction of the haul, be duplicated on all sales made at home. Here the whole issue turns on the practical question whether this country wants any of the outside world's business in steel on a basis less than the average scale of profits and wages at home, or whether the development of that business shall be left to the steel makers of Germany and England.

It should not be overlooked that this move for a greater participation by independent steel companies in the export trade in American steel is no sign of a prosperous home industry. It is rather an effort to mitigate untoward home conditions. The Steel Corporation decided early in its career to devote a portion of its tonnage to the export trade, in spite of the inducements of recurring booms at home to sell all its output at such times in the domestic market. It has adhered to that policy; and in the past year, aided opportunely by a worldwide expansion in demand for iron and steel, it has reaped substantial benefits from its foresight. At the same time the outlet it has had for, roundly, 1,800,000 tons of its products has relieved the pressure upon its home competitors. In 1909, out of a total of 1,239,709 tons of exports of iron and steel mill products, including pig iron, the Steel Corporation shipped 1,009,746 tons, or 81.4 per cent.; in 1910 its shipments were 1,223,496 tons out of a total of 1,537,952 tons, or a shade under 80 per cent. Its shipments last year, which were probably over 1,800,000 tons out of a total above 2,200,000 tons, were not far from 82 per cent.

The time could probably not be more opportune to push for a larger export trade in steel. Home prices are low and foreign prices have been advancing for several months. There is no expectation that home demand will come near to taking up capacity this year. It is entirely unlikely that any form of co-operation resulting in price maintenance will soon return. As long as they had a good share of home business at profitable prices, the independent manufacturers naturally were not greatly concerned about exports; but foreign trade looks better in proportion as the home market has lost some of its attraction.

Production and Consumption

A recent review of business in a New York daily newspaper said that "it was clearly because consumption had caught up with production that the turn in the steel trade recently occurred." Such a statement is almost as misleading as the impression given by much that has been published about iron and steel in the past six weeks, that a boom has come to the industry. For many months production of iron and steel has been fairly well adjusted to consumption, and all the time a large producing capacity has been out of commission. In these days of large consolidations it is possible to put furnaces in or out and to start or stop mills according to the inflow of business from time to time.

So far as pig iron is concerned, it was true in a number of months in 1911 that consumption was greater than production; but that was due to the fact that, as each of the little wavies in demand came along which marked the business of last year, it was found that so many furnaces had been forced out by the distressed condition of the industry that stocks had to be drawn upon temporarily. But the great number of idle furnaces, with few exceptions, remained cold and are still idle. In finished material there is a closer adjustment of production to immediate consumption, or at least to specifications and current orders, since in very few lines, as in wire products, can stock be accumulated. In the search for evidences that ultimate consumption has actually increased of late, the call for steel for cars, locomotives and rails is the item chiefly

dwell on. Very largely the increased activity at steel works—and this has been practically confined to the Pittsburgh district—has been in response to a restocking demand. Bars, wire products, sheets, tin plates and wrought pipe have all shared in this. The movement from mills into the hands of distributors, and to an extent into the hands of those who work up the products of the mills into the forms in which they ultimately enter into consumption, will be larger for a time than in the closing months of 1911; for the prices of November and December, in combination with cheap money, were irresistible. But the real test of the relation of this increased production to consumption will come later. It should not be forgotten, moreover, that there is still a margin of 20 per cent. of producing capacity, and in certain lines a higher percentage, that has not yet been called into action.

The Iron Age Index

The index to Volume 88 of *The Iron Age*, July 1 to December 31, 1911, has been compiled and printed and will be mailed to subscribers applying for it. A list of those who have received the index heretofore is kept in this office, and to all such the latest will be mailed without notice from them. Additional names will be put upon this list on request.

A Co-operative Tool Room

A number of manufacturers of hardware, representing an investment of millions of dollars, located in an active New England city, have organized a co-operative tool-room system which will save each of them much unnecessary cost. A card index has been compiled embracing the contents of the several tool rooms, except standard equipment, such as drills, taps and dogs. A duplicate set of cards has been furnished each house in the agreement, so that superintendents and others have always at hand a full knowledge of the special tools in practically the whole city. The understanding is that a member of the group may borrow from his neighbor anything in the list which he does not himself possess, providing, naturally, that the article is not in use in its owner's plant. The purpose is to keep the list up to date by adding to it a record of all special tools which are purchased from time to time.

Tool rooms accumulate a great deal of equipment which is used only at more or less rare intervals. Most of the time it is earning nothing. In manufacturing communities a great many of these tools are duplicated as between works. No sound reason exists why they should not be loaned, if by so doing a neighbor is relieved of the necessity of buying. Many of them are expensive. In the manufacture of jigs the need of these appliances is common enough. There is no doubt that in the city in question thousands of dollars a year will be saved, apportioned very evenly between those in the agreement.

Communities differ greatly in the relations of their own industries. In some places manufacturers pull strongly together. In others they work at cross purposes. In the one case they save and make money for one another. In the other they create unnecessary expense and loss of business, the effect being a mutual injury. The co-operative tool room is an excellent

illustration of what can be accomplished where there are complete harmony and a disposition to be accommodating. Even between competitors, the exchange of ideas and, possibly, equipment must result in a saving of money to each.

Correspondence

Magnetic Properties of Heat Treated Steel

To the Editor:—In James H. Herron's paper on "The Heat Treatment of Steel" printed in *The Iron Age* of November 23, 1911, the statement is made that "The magnet has been somewhat used to determine the proper annealing and hardening heat. This applies only to steels containing between 0.50 per cent. and 0.90 per cent. carbon, since steel with less than 0.50 per cent. carbon ceases to be magnetic before the hardening or annealing temperature is reached."

I do not altogether agree with him on this point. Steel containing less than 0.50 per cent. carbon may become non-magnetic before the annealing or hardening heat is reached, but the upper limit of 0.90 per cent. carbon certainly is not correct. The magnet may be used for determining the hardening or annealing temperature of steels containing 1.4 per cent. carbon or even more. I have heat treated steel containing more than 1 per cent. carbon for several years and I consider the magnet more reliable than most electric pyrometers.

A sensitive magnet, accurately balanced on pivot points just above the center of gravity, free to swing, and mounted at the end of a long brass rod, is necessary for this work.

A steel may be quenched directly after it ceases to be attracted by the magnet with the best results. Mr. Herron makes no statement as to why he thinks the magnet not useful for steels of more than 0.90 per cent. carbon.

Another statement which Mr. Herron makes under the head of "Quenching" is that "Low carbon steel, or steel below 0.30 per cent. carbon, may be quenched in water or brine." I contend that high carbon steel, properly annealed after machining, may be quenched in water or brine without disastrous results by the following method: Plunge the heated steel after becoming non-magnetic into water or brine for a few seconds, then quickly transfer it to oil to complete the cooling. It will be found that the surface of the steel will be as hard as though water or brine had been used alone, but the interior of the steel will be softer and the strains will be removed.

J. E. WASHBURN.

CLEVELAND, OHIO.

The Eastern Iron Ore Situation

Naylor & Co., New York, have been appointed sales agents for the iron ore of the Canadian Venezuelan Ore Company, Montreal, which last year acquired a lease from the Venezuelan Government of deposits in the Imataca district on the Orinoco River. The first cargo of 800 tons will be delivered at Philadelphia in February and it is expected that later in the year shipments will be made at the rate of 10,000 to 15,000 tons a month. F. P. Jones, formerly of the Dominion Iron & Steel Company, Sydney, Nova Scotia, the general manager of the Canadian Venezuelan Ore Company, is now in Venezuela completing arrangements for the company's operations in the coming season. The ore is a hard hematite running about 65 per cent. in iron, 0.035 to 0.045 per cent. phosphorus, 2.5 to 3 per cent. silica, and with little or no combined moisture. It has been offered recently to eastern furnace men on the basis of about 8 cents a unit and some trial lots have been sold. Imataca ore is not entirely unknown in this country, a shipment having been made as far back as 1888 to the Troy Iron & Steel Company, Troy, N. Y. In 1897 a cargo was brought to Philadelphia and under forced sale the ore brought slightly over 4 cents a unit.

The Ponupo Manganese Company (Charles F. Rand, Jennings S. Cox, Jr., and Pedro Aguilera), which operates the Cuero iron mine in the Daiquiri district of Cuba,

west of Santiago, has made some sales of its product among Eastern Pennsylvania furnace companies for delivery in the first six months of 1912. Heretofore the output of this property, something over 150,000 tons a year, has been taken by the Pennsylvania Steel Company and the Maryland Steel Company, but it will all be put on the general market this year. The ore is similar to that from the Daiquiri mines of the Spanish-American Iron Company, and runs 58 to 60 per cent. of metallic iron. The sales thus far made take up the expected product of the mine in the first six months of this year. The price was about 7 cents a unit.

The prospect of shipments of Lake Superior ore into eastern territory this year has been canvassed recently by representatives of Cleveland ore firms. No sales have been made, as Eastern Pennsylvania furnaces are pretty well supplied with ore, which is either in stock or under contract for some months to come. The suggestion has been made by furnace men of a delivered price to Eastern furnaces, which by absorbing some of the freight from lake ports would come nearer the price of foreign ores delivered in Eastern territory than was possible at the prices maintained on lake ores in the past year; but there is little indication that sellers of lake ore will modify their uniform practice of years of selling f. o. b. Lake Erie dock.

British Iron and Steel Prices Strong

Reports from the British iron trade indicate that the strength heretofore noted in various lines is still maintained, in spite of some weakness in the pig iron warrant market due to the operation of outside speculators. In finished lines the first week of January showed a further gain. The predicted advance in the price of Staffordshire marked bars became effective January 1, the base being raised from £8 to £8 10s. As pointed out in these columns one week ago, the demand for rolled iron has been growing and manufacturers are more fully booked than for a long time.

There are no indications that foreign manufacturers of billets and sheet bars are forcing product on the British market. The German Steel Works Union has been quoting sheet bars at 95s. f. o. b., British port. English manufacturers have been quoting 105s. delivered, but this price has not yet been paid. Foreign wire rods have advanced, the common quotation on January 10 being £5 18s. 6d. delivered in the Lancashire district.

The shipbuilding industry continues remarkably prosperous and yards are so well provided with work that few can entertain new business. Prices have risen and it is stated that for a 7000-ton steamer about \$25,000 more is asked now than a few months ago. An advance in the association price of structural steel is looked for at an early date.

The total shipments of pig iron from the Middlebrough district were 1,323,307 tons in 1911, against 1,199,388 tons in 1910. December shipments were 150,419 tons, the largest for any month since July, 1907, and a new record for December. The closing price for Cleveland pig iron warrants on Monday, January 15, was 49s. 3d., against 49s. 6d. one week previous and 50s. 10½d. at the high point on the recent movement, December 28.

Concerning the rail trade, the London Ironmonger says: "The order for 80,000 tons of steel rails for the Union of South Africa has been divided between seven of the principal British makers, many of whom are now pretty well supplied with work for the next few months. The order for 6,400 tons of 50's for the Bengal Northwestern Railway has been placed with the Workington Iron & Steel Company, while 8000 tons for Norway have gone to Germany."

The presidents of the subsidiary companies of the United States Steel Corporation held their regular monthly meeting in New York, Friday, January 12. The annual dinner of Steel Corporation officials was held in the evening.

The Vatudrip Company, manufacturer of a fluid anti-rust, has removed its New York office to the first floor of 50 Church street, with the Manufacturers' Library. W. M. Wadsworth is general manager.

The Steel Corporation and Labor

A Statement by Chairman Gary in Reply to Criticism

In an address before a New York political club last week Louis D. Brandeis, who has been rather more frequently heard from of late in tirades against large industrial operations, charged that a condition of labor slavery existed at plants of the United States Steel Corporation. On Tuesday, January 16, Chairman E. H. Gary gave out the following statement, saying that it was prepared in response to requests from the newspapers for an answer to the Brandeis charges. What Judge Gary says as to the 25 per cent. increase in wage rates since the corporation was formed is in line with the statement of Charles M. Schwab at the dinner given to him at Philadelphia last week, that in 1911, had it paid the rates of wages existing in 1901, the year of its formation, the Steel Corporation would have saved \$31,000,000.

Labor Conditions Improved

We do not resent criticism. On the contrary, we endeavor to benefit by it when we believe it is deserved. Many times statements are made which are not based upon the facts, and conclusions are drawn which we think are not justified. We would, of course, prefer to have any one interested in our affairs make inquiry of us in regard to the facts before indulging in unfavorable public criticism. It seems to us this would be fairer and wiser. However, there appear to be two different opinions with reference to this question. There should be a disposition on the part of all thinking persons to avoid hasty conclusion, to refrain from unjust attack, to encourage friendly relations between all classes, rather than to excite unnecessary animosities; and, more, to use every reasonable effort to overcome and eliminate any real and substantial abuses on the part of any one or any interest.

I am not satisfied that our management is wholly in accord with the sentiments above expressed, though such is our intention, and I trust will be recognized to be our conduct. I believe, taking everything into account, the treatment accorded by our corporation to its employees compares favorably with that of any line of industry in this country or any other country at the present time or any period in the history of the world. I may be mistaken, but I believe so. We are paying 25 per cent. higher wages than we were when the corporation was organized, and we have spent and are spending millions to prevent accidents in the works, to improve the sanitary conditions, to furnish voluntary relief in case of accident, regardless of legal liability, and for pensions to superannuates. We have standing committees constantly engaged in welfare work. We have largely abandoned seven-day-week work and have to a large extent eliminated 12-hour-a-day work. It is true there is considerable of the latter still in force; but this is largely because the employees prefer 12-hour-a-day work in order to receive a larger compensation. This question, therefore, comes back to the amount paid for labor.

Wages Not Reduced

We could, of course, reduce the hours of labor by reducing the wages. Whether or not we are paying as much as we ought to pay is one always up for consideration. It is well known we have in the past declined to reduce wages when many, if not most, others were making reductions. Above all, we are trying to satisfy our employees that they are receiving fair and liberal treatment; and I think they appreciate our efforts. As to the disposition of the corporation toward its employees, I would refer to remarks made by me to the presidents at one of their meetings many months since, which were not made for publication, but were given out by some of our officials.

As to the business success of the corporation since it was organized, it would not be becoming for the management to say very much at this time. We publish the facts and figures from time to time and leave those who are interested to determine. We are making a better quality of products at a less cost, considering everything, and selling at lower prices on the average, and are paying higher wages than ever before in the trade. We have increased and are increasing our export business enormously, and

during the year 1911 it amounted in dollars and cents to not less than \$70,000,000—probably ten times as much as the subsidiary companies were doing at the time of the organization of the corporation.

Our corporation and its affairs have been under investigation by various departments of the Government most of the time for many years, and pending Government suit has brought into question our organization and its management since; and we believe, if every one interested will keep cool and postpone judgment until full development of all the facts and conditions is made, there will be no good ground for charging that the creation or the management of the corporation has been inimical to the public welfare.

The Proposed Brier Hill Steel Company

For a long time a number of the merchant blast furnaces in the Mahoning Valley, Ohio, have recognized the fact that changing conditions were making it imperative that a new channel of consumption for their pig iron should be found. About a year ago the Youngstown Steel Company considered the building of an open-hearth steel plant, but for various reasons went no further. Negotiations have since then been conducted between furnace interests with a view of consolidating and building a steel plant, and it seems now that this plan will go through.

The Brier Hill Iron & Coal Company, operating Grace furnace at Youngstown with a capacity of 140,000 tons of pig iron per year; the Youngstown Steel Company, operating a blast furnace with a capacity of 100,000 tons per year, and the Thomas Steel Company, Niles, Ohio, operating sheet mills, propose to consolidate as the Brier Hill Steel Company, with a capital stock of \$15,000,000, and to build an open-hearth steel plant adjacent to the blast furnace of the Brier Hill Iron & Coal Company. It is possible, but not yet settled, that the Empire Iron & Steel Company and the De Forest Sheet & Tin Plate Company, both operating sheet and tin plate mills at Niles, may be included in the merger.

The new plant will have a capacity of probably 1000 tons of steel per day, which will be furnished in the form of billets and sheet and tin bars to sheet and tin plate mills in the district. The furnace companies mentioned have large ore and coal properties, so that the steel company will be self-contained, making its steel from the ore up. It is stated that no bonds will be issued, but that the financing will be wholly done by those interested.

Extending Machinery Exports

Capt. Godfrey L. Carden, general manager of the Allied Machinery Company of America, who is now in Europe, is devoting himself principally to the establishment of new agencies for his company. The plans call for the location of branch offices in Austria-Hungary, Turkey, the Balkan States, Russia, Sweden, Denmark, Norway, Roumania and England. The company, which was organized to sell American machinery abroad, already has agencies in Paris, Brussels, Vienna and Milan. Considerable opposition has been encountered in Germany, but Captain Carden reports that the general field progress of the company is extremely satisfactory. At the expiration of about five months Captain Carden is expected to return to New York for a conference at the home office of the company, at 55 Wall street, of which C. N. Thorn is in charge.

Iron Ore Briquettes at German Furnaces

Blast furnace operators will be interested in the statement that the Friedenshuette in Silesia, which operates five blast furnaces and which up to 1909 was using fine ores only, has since that time substituted to the extent of 20 per cent. briquettes made by the Schumacher process, which are produced from 44 per cent. flue dust and 56 per cent. fine ores. At any time when one of its furnaces is giving trouble this company uses as "medicine" an increased percentage of these briquettes. The management of the Friedenshuette has found that by using these briquettes its furnaces not only run better but that there is an appreciable saving in coke consumption.

The Iron and Metal Markets

New Orders Equal Output

Rail Mills Wait for Business

New York Central Order Largely Open Hearth Rails—Contracts for Cast Iron Pipe

It was not to be expected that the December pace would be kept up, with new bookings of finished steel at twice the rate of shipments, yet January thus far has not been disappointing to the leading steel companies. In spite of published reports of unexpected quietness, most of the leading steel companies have put as much business on their books this month as has gone out in shipments, and that with but moderate demand from the railroads. Some have done better than this, and others, Eastern plate mills in particular, not so well.

The weakest spot in the situation is still the large idle rail capacity, and from to-day's standpoint the promise of tonnage for 1912 is not better than that of a year ago. The New York Central has given out about 115,000 tons, of which 55,000 to 60,000 tons went to Steel Corporation mills and most of the remainder to the Lackawanna Steel Company. Most of the order is for open-hearth rails, though a considerable amount of titanium Bessemer rails will be rolled at Buffalo. In the case of the Pennsylvania contract, more rigid specifications still cause delay, and this is true elsewhere.

Prices of finished steel have not advanced and are not likely to do so. Some irregularities prevail, and the heavy December movement, while it established advances of \$1 to \$2 a ton in some lines, has not changed the fact that the price on each order is determined by its desirability and the amount of competition.

The Steel Corporation is still exceptional in the amount of capacity it is taking from the idle lists. In the past week one McKeesport, one Lorain, one Sharon and one Gary furnace have been blown in, and the two Columbus, Ohio, furnaces and the connected steel plant have been started up to take care of the demand for sheet and tin plate bars.

There is some holding back of information on new car orders, particularly in the case of Pennsylvania Railroad contracts. The Rock Island has distributed orders for 3000 freight cars and the Northern Pacific has placed 500 steel gondolas. Orders pending include 5000 for the Northern Pacific and 8000 for the Atchison.

For each of the two battleships for which the Government has opened bids about 11,000 tons of steel will be needed, aside from armor, and Pittsburgh is expected to furnish the greater part of the plates and shapes. Both plate and structural business has been quiet in the past week, but considerable railroad bridge work is pending, including 6000 tons in the Chicago district. There is evidence that the equivalent of 1,100, Pittsburgh, has been done on plain material at Chicago.

The move to organize a new company through which the export business of the independent steel companies shall be handled is significant, as indicating the expectation that surplus production will be a continuing condition. An early meeting of representatives of the large independent companies will be called to further the project.

The Western cast-iron pipe trade is quite active and

the prospect of spring business is good. An award of 5000 tons will be made at Chicago January 18, and of the same amount at St. Paul January 19. Minneapolis has bought 3750 tons, the St. Paul Gas Company 2000 tons and Milwaukee 2500 tons.

In pig iron business has fallen off in the past week and prices are still very unsatisfactory. On any considerable order competition is sharp. Southern iron holds at \$10, Birmingham, with demand only moderate. Too much significance may be given the recent export orders for 10,000 tons of Southern foundry iron for England and 15,000 tons for Mediterranean delivery. The closeness of prices realized to those on domestic sales only accentuates the small profits at home.

It is announced that two Mahoning Valley blast furnaces and a sheet interest will be merged and that possibly other sheet mills will be included. The building of an open hearth plant by the new company will furnish an outlet for pig iron on one hand and on the other will assure the sheet mills of a supply of steel.

An interesting development in the Eastern iron ore market is the offering for 1912 delivery of Bessemer ore from the Imataca mines of Venezuela, which have been opened by Canadian interests. Some Cuban ore is also being offered to Eastern furnace men. Thus far there are no indications that Lake Superior ore companies will meet the prices of foreign ores in 1912 in the Eastern market. Expectations are that this year's movement of ore on the Lakes will be considerably larger than in 1911. It may reach 40,000,000 tons.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 17, 1912.	Jan. 10, 1912.	Dec. 20, 1911.	Jan. 18, 1911.
Pig Iron, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	\$14.85	\$14.85	\$14.85	\$15.50
Foundry No. 2, Valley furnace	13.00	13.00	13.00	13.75
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.00	14.00	14.00	15.50
Basic, delivered, eastern Pa.	14.25	14.25	14.25	14.25
Basic, Valley furnace	12.50	12.50	12.25	13.25
Bessemer, Pittsburgh	15.15	15.15	15.15	15.90
Gray forge, Pittsburgh	13.40	13.40	13.40	14.15
Lake Superior charcoal, Chicago	16.00	16.00	16.50	18.00
Billets, etc., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	20.00	19.00	23.00
Open hearth billets, Pittsburgh	20.00	20.00	19.00	23.00
Forging billets, Pittsburgh	28.00	28.00	25.00	28.00
Open hearth billets, Philadelphia	22.40	22.40	21.40	25.40
Wire rods, Pittsburgh	24.50	24.00	24.50	28.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	15.00	15.00	14.75	14.50
Iron rails, Philadelphia	16.50	16.50	16.00	17.00
Car wheels, Chicago	13.25	13.25	13.00	13.00
Car wheels, Philadelphia	12.50	12.50	12.50	13.00
Heavy steel scrap, Pittsburgh	13.00	13.00	12.25	13.50
Heavy steel scrap, Chicago	10.50	10.50	10.25	11.50
Heavy steel scrap, Philadelphia	12.25	12.25	12.25	12.50
Finished Iron and Steel,				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill..	1.25	1.25	1.25	1.25
Iron bars, Philadelphia.....	1.27½	1.27½	1.25	1.32½
Iron bars, Pittsburgh.....	1.25	1.25	1.25	1.35
Iron bars, Chicago.....	1.15	1.15	1.15	1.30
Steel bars, Pittsburgh.....	1.15	1.15	1.15	1.40
Steel bars, tidewater, New York	1.31	1.31	1.31	1.56
Tank plates, Pittsburgh.....	1.15	1.15	1.15	1.40
Tank plates, tidewater, New York	1.31	1.31	1.31	1.56
Beams, Pittsburgh.....	1.15	1.15	1.15	1.40
Beams, tidewater, New York....	1.31	1.31	1.31	1.56
Angles, Pittsburgh	1.15	1.15	1.15	1.40
Angles, tidewater, New York....	1.31	1.31	1.31	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.15	1.25
Skelp, sheared steel, Pittsburgh	1.20	1.20	1.20	1.30

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire.

Per Pound to Largest Buyers:	Jan. 17, Jan. 17, Dec. 20, Jan. 18.			
	1912.	1912.	1911.	1911.
Cents.	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.90	1.90	1.90	2.20
Wire nails, Pittsburgh	1.55	1.55	1.55	1.70
Cut nails, Pittsburgh	1.50	1.50	1.50	1.60
Fence wire, ann'led, 0 to 9, Pgh.	1.35	1.35	1.35	1.50
Barb wire, galv., Pittsburgh	1.85	1.85	1.85	2.00

Metals, Per Pound:

Lake copper, New York	14.62½	14.62½	14.00	12.75
Electrolytic copper, New York	14.37½	14.50	13.87½	12.50
Spelter, St. Louis	6.50	6.35	6.15	5.55
Spelter, New York	6.65	6.50	6.30	5.40
Lead, St. Louis	4.35	4.35	4.35	4.50
Lead, New York	4.45	4.45	4.45	4.30
Tin, New York	42.50	43.50	45.00	41.75
Antimony, Hallett, New York	7.65	7.60	7.75	7.87½
Tin plate, 100 lb. box, New York	\$3.64	\$3.64	\$3.64	\$3.84

Coke, Connellsville,

Per Net Ton, at Oven:	Cents.	Cents.	Cents.	Cents.
Furnace coke, prompt shipment	\$1.85	\$1.85	\$1.60	\$1.40
Furnace coke, future delivery	1.70	1.70	1.65	1.75
Foundry coke, prompt shipment	2.00	1.90	1.90	1.90
Foundry coke, future delivery	2.15	2.10	2.15	2.25

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb., New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6½ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¾ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.15c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.20 to 1.25
H-beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.20 to 1.25
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909.	1.20 to 1.25
Tees, 3 in. and up.	1.20 to 1.25
Zees, 3 in. and up.	1.15 to 1.20
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909.	1.20 to 1.25
Deck beams and bulb angles	1.45 to 1.50
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.30 to 1.35
Nos. 9 to 10	1.40 to 1.45
Nos. 11 and 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.60 to 1.65

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.55 to 1.60	.....
Nos. 13 and 14	1.60 to 1.65	.....
Nos. 15 and 16	1.65 to 1.70	1.75 to 1.80
Nos. 17 to 21	1.70 to 1.75	1.80 to 1.85
Nos. 22, 23 and 24	1.75 to 1.80	1.85 to 1.90
Nos. 25 and 26	1.80 to 1.85	1.90 to 1.95
No. 27	1.85 to 1.90	1.95 to 2.00
No. 28	1.90 to 1.95	2.00 to 2.05
No. 29	1.95 to 2.00	2.05 to 2.10
No. 30	2.05 to 2.10	2.15 to 2.20

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	1.90 to 1.95
Nos. 12, 13 and 14	2.00 to 2.05
Nos. 15, 16 and 17	2.15 to 2.20
Nos. 18 to 22	2.30 to 2.35
Nos. 23 and 24	2.40 to 2.45
Nos. 25 and 26	2.60 to 2.65
No. 27	2.75 to 2.80
No. 28	2.90 to 2.95
No. 29	3.00 to 3.05
No. 30	3.20 to 3.25

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Corrugated Roofing Sheets Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	\$2.30	23	\$2.35	\$3.45
28	\$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.00	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, \$24.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, \$1.35; galvanized, \$1.65. Carload lots, to retailers, annealed, \$1.45; galvanized, \$1.75. Galvanized barb wire to jobbers, \$1.85; painted, \$1.55. Wire nails, to jobbers, \$1.55.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	\$1.50	\$1.55	\$1.60	\$1.65	\$1.75	\$1.85	\$1.95	\$2.05
Galvanized	1.80	1.85	1.90	1.95	2.05	2.15	2.35	2.65

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from December 1, 1911:

Butt Weld.

	Steel	Iron		
	Black.	Galv.	Black.	Galv.
1/8 and 3/16 in.	74	54	68	48
5/16 in.	75	65	69	59
1/4 in.	78	68	72	62
5/8 to 1 1/2 in.	81	73	75	67
2 to 3 in.	82	75	76	69

Lap Weld.

1 1/2 and 1 1/4 in.	..	..	68	61
2 in.	79	72	72	65
2 1/2 to 4 in.	81	74	74	67
4 1/2 to 6 in.	80	72	73	65
7 to 12 in.	78	68	71	61
13 to 15 in.	55	..	47	..

Butt Weld, extra strong, plain ends, card weight.

1/8 in.	60	60	65	55
5/16 in.	65	69	70	64
1/4 to 1 1/2 in.	68	62	63	57
2 to 3 in.	70	64	65	59

Butt Weld, double extra strong, plain ends, card weight.

2 in.	66	60	61	55
2 1/2 to 4 in.	68	62	63	57
4 1/2 to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

Will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld as specified.
1 to 1 1/2, 2 to 3 in. Butt Weld
2 1/2 to 4 in. Lap Weld
4 1/2 to 6 in.
7 to 8 in.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in car-loads are as follows:

Steel.	Standard Charcoal Iron.
1 $\frac{3}{4}$ to 2 $\frac{1}{2}$ in.....	.65
2 $\frac{1}{2}$ in.....	.67 $\frac{1}{2}$
2 $\frac{3}{4}$ to 3 $\frac{1}{4}$ in.....	.72 $\frac{1}{2}$
3 $\frac{1}{2}$ to 4 in.....	.75
5 to 6 in.....	.67 $\frac{1}{2}$
7 to 13 in.....	.65

Locomotive and steamship
special grades bring higher prices.

2 $\frac{1}{2}$ in. and smaller, over 18 ft., 10 per cent. net extra.
2 $\frac{1}{2}$ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for car-loads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f. o. b. mill at Pittsburgh basing discounts, lowered by two points.

Pittsburgh

PITTSBURGH, PA., January 17, 1912.

Despite the intensely cold weather, the output of pig iron and rolled products in this district is heavier now than at any time in probably more than a year. On Monday the National Tube Company started up another blast furnace at McKeesport, making three out of four in operation there; another Lorain furnace will be started this week, making four out of five in operation at Lorain, and the two furnaces at Wheeling are in operation, so that this company is now running 9 of its 11 blast furnaces. The Jones & Laughlin Steel Company started last week a second Talbot open-hearth furnace at Aliquippa and another furnace will be started probably next week, and the fourth about February 1; this plant will have an output of about 1000 tons of steel per day. The Carnegie Steel Company will probably start up two or three more blast furnaces in the near future. The Cambria Steel Company reports that it is quite well filled up in its plate, structural and wire departments and that its car works has also a good run of orders ahead. Pig iron has been quiet, with no large inquiries pending. The steel market continues very active and prices are firm. Coke is more active and for prompt shipment is higher.

Pig Iron.—Some fairly large sales have been made. The Standard Sanitary Mfg. Company has bought 4500 tons of No. 2 foundry for its Allegheny and New Brighton works on the basis of \$13 at Valley furnace, for delivery in first quarter, and for its Louisville works has bought 2000 tons of No. 2 soft and 1000 tons of gray forge on the basis of \$10, Birmingham, for No. 2, also for delivery in first quarter. A local interest bought last week 1000 tons of standard Bessemer at \$14.10, Valley, or \$15, delivered. It is understood that this iron was bought through a dealer, as all the Valley furnaces are reported as holding Bessemer firm at \$14.25 and basic at \$12.75 to \$13, Valley. Another local interest is reported as having bought 2000 tons of Bessemer from a Valley maker at \$14.25 at furnace. A local open-hearth steel plant has closed for 3000 tons more of basic iron, making 9000 tons in all, but it is understood that this iron does not come from Valley furnaces. The Scottdale furnace of Corrigan, McKinney & Co. was blown in last week, and the furnace of the Clinton Iron & Steel Company, at Pittsburgh, was banked. We quote standard Bessemer iron at \$14.25, Valley furnace, but note that dealers sometimes shade this price 10c. to 15c. per ton. Basic iron is firm at \$12.50 to \$12.75; malleable Bessemer, \$12.75; No. 2 foundry \$13; gray forge \$12.50, all at Valley furnace, the rate for delivery in the Pittsburgh district being 90c. a ton.

Steel Billets and Sheet Bars.—The large steel mills report that specifications on contracts for billets and sheet bars continue to come in at a very heavy rate. The billet and rail sales department of the Carnegie Steel Company has entered orders so far this month for rolling which represent in tonnage a large increase over the first half of December. This company will start up its Columbus plant as soon as possible on sheet bars, on which it is getting considerably behind. It has turned down a large tonnage of billets and sheet bars on which it could not make deliveries. Prices on steel are very strong. We quote: Bessemer and open-hearth billets, 4 x 4 in., up to 0.25 carbon, \$20; Bessemer and open-hearth sheet bars, \$21, and forging billets, \$28, Pittsburgh or Youngstown.

Ferrromanganese.—The price of \$41, Baltimore, is still quoted, but two or three dealers occasionally shade it about 25c. a ton on material bought before the higher price was fixed. Sales of three cars, or about 75 to 90 tons, are reported at \$41, Baltimore, for standard English 80 per cent. The rate to Pittsburgh is \$1.95 a ton.

Ferrosilicon.—New inquiry is quiet. A sale of a carload, or about 30 tons, of 50 per cent. was made at \$70, Pittsburgh. We quote small lots of 50 per cent. at \$70; 100 to 500-ton lots at \$69, and over 500 tons at \$68, Pittsburgh. We quote 10 per cent. at \$21; 11 per cent., \$22, and 12 per cent., \$23, f.o.b. cars at furnace, Ashland, Ky., or Jackson, Ohio. These latter prices, however, are sometimes materially shaded.

Muck Bar.—The market is quiet, but prices are ruling fairly strong. We quote best grades of muck bar, made from all pig iron, at \$28 to \$28.50, Pittsburgh.

Wire Rods.—New inquiry is quiet, as most consumers are covered. The recent price of \$24 has been withdrawn by leading makers, and we now quote \$24.50 to \$25 for Bessemer, open-hearth and chain rods, f.o.b. Pittsburgh.

Steel Rails.—The order of the Pennsylvania Railroad, which is reported to be 150,000 tons, has not yet been distributed to the various mills, but may possibly come out within the week. The new demand for light rails continues fairly good. The Carnegie Steel Company booked new orders and specifications the past week for about 3500 tons. Sales of splice bars are fairly heavy, and some good orders are expected for these when pending rail orders are placed. We quote splice bars at 1.50c. per lb., and repeat quotations on rails: Standard sections, 1.25c. per lb.; 8 and 10-lb. light rails, 1.25c.; 12 and 14-lb., 1.16c.; 16, 20 and 25-lb., 1.12c.; 30 and 35-lb., 1.10c., and 40 and 45-lb., 1.08c., f.o.b. at mill.

Structural Material.—A limited amount of work has been placed the past week, and specifications have not been active, probably due to the extreme cold weather. New inquiries are fairly heavy. The Ft. Pitt Bridge Works has taken 300 tons of bridge work for the New York Central and about 350 tons for new buildings for the West Penn Steel Company, Brackenridge, Pa. The Jones & Laughlin Steel Company has taken some additional area work for the New York Central, about 700 tons. The East End Savings & Trust Company, of this city, is now taking estimates for a new bank and office building to be 14 stories, requiring 3000 to 4000 tons, and bids have gone in on 4000 tons for the new building of the Dime Savings Bank at Detroit, Mich. Prices are reported firm, the minimum on beams and channels up to 15 in. being 1.15c., while small orders are being placed at 1.20c., f.o.b. Pittsburgh.

Plates.—The only steel car order reported was for 500 steel gondola cars for the Northern Pacific Railroad, which went to the Pressed Steel Car Company. It is reported, but not confirmed, that the Pennsylvania Lines West may buy 3500 more cars. The plate mills report that specifications are coming in very freely, and their operations are on a heavier basis than for some months. We quote $\frac{3}{4}$ -in. and heavier plates at 1.15c. for large lots and 1.20c. in small lots, f.o.b. mill, Pittsburgh.

Sheets.—Operations of the sheet mills are increasing, and as a whole they are now running very close to 85 per cent. of capacity. Specifications are coming in at a heavy rate, but new buying is dull as most consumers covered for their requirements some time ago. Several mills report trouble in getting deliveries of sheet bars as fast as needed. The market seems to be firm on the basis of prices named on a preceding page.

Tin Plate.—New buying is light, as consumers have covered freely, but specifications against contracts are coming in well and the mills are now operating to 80 per cent. or more of capacity. On the small amount of new business being placed \$3.40 per base box for 14 x 20 coke plates is reported as being quite well maintained.

Bars.—New business in steel bars is quiet, and specifications against contracts have shown a falling off. This is no doubt due to the inventory and holiday periods and to the extremely cold weather. The demand for hard steel bars for reinforcing purposes is fairly active. We quote steel bars at 1.15c. to 1.20c., for delivery in first quarter, and iron bars at 1.25c. to 1.30c., f.o.b. maker's mill, Pittsburgh.

Hoops and Bands.—Specifications against contracts are not so active as in the early part of December, and the new demand has been quiet so far this month. We quote steel bands at 1.15c., extras as per the steel bar card, and hoops at 1.25c., for delivery in first quarter, f.o.b. Pittsburgh.

Rivets.—Several of the railroads have recently placed heavy contracts for delivery over the first half of this year. We quote structural rivets at 1.50c. and boiler rivets at 1.55c., f.o.b. Pittsburgh. On a very nice specification some makers might slightly shade these prices.

Shafting.—Very little new buying is taking place, but specifications against contracts are coming in at a fair rate. We quote cold rolled shafting for ordinary orders at 65 per cent. off in carloads and larger lots and 60 and 5 per cent. off in small lots, delivered in base territory.

Spelter.—The market has shown a sharp advance and prime grades of Western are scarce at 6.50c., East St. Louis, equal to 6.62½c., Pittsburgh.

Wire Products.—Consumers of wire and wire nails covered their requirements ahead for 60 to 90 days prior to the advance in prices December 11, and as a result little new buying is being done. The cold weather has interfered seriously with consumption, and this is being felt in specifications. Prices are stated to be firmly held. We quote: Wire nails, \$1.55; cut nails, \$1.50; galvanized barb wire, \$1.85; painted, \$1.55; annealed fence wire, \$1.35; galvanized fence wire, \$1.65, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—More orders for line pipe have been placed and others are pending. The Philadelphia Company, of this city, has placed a contract with a local mill for six miles of 12-in. steel pipe, and the Devonian Oil Company is in the market for 10 miles of 6-in. There is also an inquiry out for 20 miles of 18-in. for delivery at Moose Jaw, Sask., Canada. Mills state that prices on merchant pipe are being well maintained, but low figures have been made on recent contracts for line pipe. The demand for merchant pipe so far this month has been about as heavy as in the same period in December, but if the cold weather continues new orders are likely to show a falling off.

Tubes.—Some large contracts for locomotive tubes have been taken by local mills recently for delivery over the first half. The extremely low prices on boiler tubes put out some time ago by several mills, and at which large contracts were placed, have been withdrawn and higher prices are now being quoted. The new demand for merchant tubes is only fair.

Iron and Steel Scrap.—Several dealers report that prices are a trifle softer, due to the fact that several of the largest consumers have covered ahead for some time and are out of the market. New inquiry is therefore not so active and the upward movement in prices seems to have stopped for the time being. We note sales of 1500 to 2000 tons of special grade heavy steel scrap at \$13.25, delivered, and also sales of about 1000 tons of borings at \$9.85 to \$10, delivered. Dealers quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pitts- burgh delivery	\$13.00 to \$13.25
No. 1 foundry cast	12.50 to 12.75
No. 2 foundry cast	10.25 to 10.50
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.75 to 11.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.25 to 15.50
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
*Cast iron borings	9.85 to 10.00
*Machine shop turnings	10.00 to 10.25
Sheet bar crop ends	13.75 to 14.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

†Shipping point.

Coke.—Extremely cold weather has interfered seriously with operations at ovens, and high prices continue to be paid for furnace coke of standard grades, which is scarce and in active demand. Sales of several lots of standard furnace coke for spot shipment have been made at \$2 a ton, which is a little above the market, and also sales of 1800 to 2000 tons at \$1.85 to \$1.90. The Inland Steel Company has placed a contract with the J. H. Hillman & Sons Company, Oliver Building, for 12,000 to 15,000 tons of furnace coke per month, running up to July 1, the coke to be furnished by the Thompson-Connellsville Coke Company. The contract of the Westinghouse Electric & Mfg. Company for foundry coke, referred to in print recently, was placed two or three weeks ago with the Bessemer Coke Company, Oliver Building, and runs from 1200 to 1500 tons per month. There is also an active demand for foundry coke for spot shipment and prices are higher. The H.

C. Frick Coke Company has recently started between 3000 and 3500 ovens in the Connellsville region and the W. J. Rainey Coke Company has also started more ovens. Prices are very strong, and we quote standard grades of furnace coke for spot shipment at \$1.85 to \$1.90 and 72-hr. foundry for prompt shipment at \$2 to \$2.15, per net ton, at oven.

Chicago

CHICAGO, ILL., January 16, 1912.

Orders for the leading items of finished steel continue to be received by the mills in large volume, and the totals for the past week were among the largest for a year, despite the lack of orders for rails. Both rail mills in this district are down. Rail contracts covering a total of about 140,000 tons remain unplaced, pending the settlement of specifications. While it is maintained that all of the advances in price since December 1 are being adhered to, evidence is not lacking that numerous irregularities prevail, and the price for each order varies in accordance with its desirability and the degree of competition. New contracts for cars were few in the past week. The pig iron market is still unsatisfactory because of the low prices prevailing. Trading in old material has been light, with prices slightly weakened by the lack of demand.

Pig Iron.—A number of sales of local foundry and malleable iron were recorded the past week, the average running from 400 to 700 tons. This iron brought \$14 at the furnace. Several inquiries for iron likely to be placed in the next few days are reported, including one for 3000 tons of foundry iron. In Milwaukee the demand seems to have slackened somewhat; under prevailing conditions, this market is almost entirely isolated from that of Chicago. Inquiry for Southern iron has been very quiet and the business placed has been in carloads for the most part; the market remains at \$10, Birmingham, for No. 2, although some furnace schedules are 50c. above this price. We continue to quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	\$16.00 to \$16.50
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85
Southern coke, No. 2	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	16.75
Basic	14.75
Jackson County and Kentucky silvery, 6 per cent.	16.40
Jackson County and Kentucky silvery, 8 per cent.	17.40
Jackson County and Kentucky silvery, 10 per cent.	18.40

Rails and Track Supplies.—The railroads apparently have not yet arrived at their decision regarding the specifications for 1912 rails. Orders for approximately 140,000 tons, the distribution of which has been practically decided, are still pending here. The local rail mills, which were shut down for repairs, are still in idleness. In contrast, railroad specifications for tie plates and track fastenings are heavy. In addition to that portion of the Pennsylvania Railroad car orders placed with Western shops, the Pressed Steel Car Company received an order for 500 steel gondolas from the Northern Pacific. It is also reported that the Rock Island has distributed its orders for a total of 3000 freight cars. Important car orders still pending include 5000 for the Northern Pacific and 8000 for the Santa Fe. Numerous small orders for both cars and locomotives are likewise about to be placed. We quote standard railroad spikes at 1.50c., base; track bolts, with square nuts, 1.90c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Structural Material.—While rolling-mill schedules for structural shapes hold up fairly well as a result of car-shop specifications and railroad specifications for bridge work, contracts for fabricated steel have been light. The most important award reported during the week was that for the new Union Tool Works near San Francisco, amounting to 1100 tons, which was taken by the Morava Construction Company, Chicago. Other contracts totaled only 1189 tons, including 112

tons for a post office at Florence, Ala., awarded to the Phoenix Iron Works; 224 tons of crane girders for the Pawling & Harnischfeger Company, Milwaukee; 12 storage tanks for the Corn Products Refining Company, requiring 278 tons; 396 tons for the Midland Bridge Company, awarded to the American Bridge Company, and two highway spans in Douglas County, Ore., taken by the Portland Bridge & Iron Company. Figures are being taken on 3000 tons of bridge steel for the Rock Island; 2000 tons for the Chicago Great Western, and about 1000 tons for the Chicago & Northwestern. There are some evidences that prices are being made in this territory equivalent to 1.30c., Pittsburgh. The general run of business, however, is placed, at quotations above 1.30c., Chicago, and we quote for mill shipment, Chicago delivery, 1.30c. to 1.38c., and from store, 1.60c.

Plates.—Plate tonnage continues to mount on the books of the mills, now under some stress to make deliveries. The market position of plate producers has every appearance of strength, and it seems more than likely that the fear of checking the present buying movement is operating toward the holding of prices upon the present basis. Although well supplied with orders at this time, a continuance of the present rate of buying is ardently desired. For Chicago delivery mill shipment, we quote 1.30c. to 1.38c., and from store, 1.60c.

Sheets.—A large tonnage of sheets at low and irregular prices is still the rule. It is believed that the major portion of the business is being diverted to the more favorably situated mills, from which the most attractive prices can be obtained. In this product competition seems particularly keen and prices regain their firmness but slowly. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.; No. 10 blue annealed, 1.53c. to 1.58c. Prices from store, Chicago, are: No. 10, 1.90c.; No. 12, 1.95c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—Bar iron mills are rejoicing in a slightly stronger situation, with the major portion of business bringing 1.17½c. and 1.20c., with 1.15c. an absolute minimum for the most desirable specifications. Steel bar tonnage is heavy, and local mills are provided with orders sufficient to carry them for several weeks in the future. The prevailing quotation for the better class of business is 1.25c., Chicago. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.15c. to 1.20c. From store: Soft steel bars, 1.50c. to 1.55c., Chicago.

Old Material.—Little interest has been displayed in old material by melters. Correspondingly, those dealers who had scrap on track to dispose of were decidedly active. The net result has been a tendency to concede something from the high point recently reached. The market movement, however, has been too light to establish any distinct change in the situation. Some slight recessions may develop, but marked weaknesses are not anticipated. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.

Old iron rails.....	\$15.00 to \$15.50
Old steel rails, rerolling.....	12.75 to 13.25
Old steel rails, less than 3 ft.....	11.75 to 12.25
Relying rails, standard section, subject to inspection.....	24.00
Old car wheels.....	13.25 to 13.75
Heavy melting steel scrap.....	10.50 to 11.00
Frogs, switches and guards, cut apart.....	10.50 to 11.00
Shoveling steel.....	10.25 to 10.75
Steel axle turnings.....	8.50 to 9.00

Per Net Ton.

Iron angles and splice bars.....	\$12.75 to \$13.25
Iron arch bars and transoms.....	13.75 to 14.25
Steel angle bars.....	10.25 to 10.75
Iron car axles.....	18.00 to 18.50
Steel car axles.....	15.50 to 16.00
No. 1 railroad wrought.....	11.25 to 11.75
No. 2 railroad wrought.....	10.25 to 10.75
Steel knuckles and couplers.....	10.00 to 10.50
Steel springs.....	10.50 to 11.00
Locomotive tires, smooth.....	13.25 to 13.75
Machine shop turnings.....	6.75 to 7.25
Cast and mixed borings.....	6.00 to 6.50
No. 1 busheling.....	9.00 to 9.50
No. 2 busheling.....	6.25 to 6.75
No. 1 boilers, cut to sheets and rings.....	7.00 to 7.50
Boiler punchings.....	12.50 to 13.00
No. 1 cast scrap.....	14.00 to 11.50
Stove plate and light cast scrap.....	9.25 to 9.75
Railroad malleable.....	10.50 to 11.00
Agricultural malleable.....	9.00 to 9.50
Pipes and flues.....	8.00 to 8.50

Wire Products.—Although retarded in the South, where the cotton situation has limited the buying

power, the sale of wire fencing and barb wire is well maintained by unusually excellent prospects for the coming spring in other sections. Manufacturers' demand for plain wire is up to expectations. Increasing strength in the market for wire products is forecasted. We quote: Plain wire, No. 9 and coarser, base, \$1.53; wire nails, \$1.73; painted barb wire, \$1.73 to \$1.78; galvanized, \$2.03 to \$2.08; polished staples, \$1.78 to \$1.83; galvanized, \$2.08 to \$2.13, all Chicago.

Cast Iron Pipe.—The prospect is increasingly promising. It is expected that an award of 5000 tons will be made at Chicago January 18 and of a similar amount at St. Paul January 19. At Minneapolis last week 3750 tons was awarded to the American Cast Iron Pipe Company. The St. Paul Gas Company has ordered 2000 tons from the United States Cast Iron Pipe & Foundry Company, which will also furnish 2500 tons of gas pipe for Milwaukee. The local gas company has under consideration the purchase of a large tonnage, which it is expected to close for in the near future. We quote as follows, per net ton, Chicago: Water pipe, 4-in., \$26.50; 6 to 12-in., \$24.50; 16-in. and up, \$24, with \$1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., January 16, 1912.

Buying has been less pronounced although specifications against contracts have been somewhat better. The productive rate at some of the Eastern mills has been a trifle larger. While some makers are still endeavoring to get prices of rolled products on a better basis, desirable orders can be placed at the recent minimum, 1.30c., delivered here, for plates, shapes and steel bars. Steel billets are a shade more active. Coke is quieter, but prices are firm. The old material market is practically at a standstill.

Iron Ore.—Further sales of local ores are reported for delivery over the first half of the year at prices ranging from 7c. to 7½c. a unit, depending on the character and quality of the ore. Sales of Cuban ore on the same basis have also been made. No further offerings of foreign ore have been announced, and consumers are beginning to feel that they will be unable to rely on what have been regular supplies for the past few years. Purchases of foreign ore abroad as well as prohibitive ocean freight have curtailed offerings in this country. Importations during the week included 19,125 tons of Cuban and 5617 tons of Swedish ore.

Pig Iron.—Transactions have latterly been on a materially smaller scale. Consumers are now apparently pretty well taken care of for near future requirements, and, with the exception of an occasional 500 to 1000-ton order, current business has been confined to small lots in foundry grades. The majority of the Eastern producers show less anxiety to trade, and a number, particularly those who have curtailed production, are holding firmly at \$15.25, delivered, for No. 2 X; at the same time \$14.85 to \$15 is still available and a good share of the business is put through at these prices. A sale of 1000 tons of Virginia foundry is reported, but individual sales seldom exceed a few hundred tons, prices for which still range from \$12.25 to \$12.50 at furnace. Efforts are being made by producers of rolling mill forge iron to get better prices; a consumer in the Schuylkill Valley has taken on several thousand tons at \$14.25, delivered, but several furnaces are now holding for \$14.50. A little more inquiry for this grade is reported. Cast iron pipe makers have not been very active buyers. Odd lots have been taken, but there is no definite inquiry involving any material quantity. Very little has been done in steel making grades. The recent local purchaser of large blocks of Bessemer and low phosphorus iron has an inquiry out for 3000 to 5000 tons of the latter grade, for delivery over the second half. A nearby consumer of basic iron is still negotiating for several thousand tons for the second quarter. Temple furnace was blown in last week. The general range of prices shows no variation from recent quotations, the following being named for standard brands, delivered in buyers' yards in this district, in the first quarter and half of the year:

Eastern Pennsylvania No. 2 X foundry.....	\$14.85 to \$15.25
Eastern Pennsylvania No. 2 plain.....	14.60 to 15.00
Virginia foundry.....	15.00 to 15.50
Gray forge.....	14.25 to 14.50
Basic.....	14.25 to 14.50
Standard low phosphorus.....	19.25 to 19.75

Ferroalloys.—No fresh inquiry has developed. Small transactions in 50 per cent. ferromanganese, largely carload lots, are reported at \$41, Baltimore. Ferrosilicon, either 50 per cent. or 10 to 12 per cent. furnace grade, remains quiet.

Billets.—Eastern producers maintain recent quotations for both rolling and forging billets, although slightly better prices are obtained for small prompt lots. Orders have been coming in somewhat more freely and mill activities are slightly better. Consumers are showing more interest in the market and would contract for extended shipment if makers would accept the business. For delivery in this vicinity basic open-hearth rolling billets are quoted at \$22.40 to \$23, and forging billets at \$26.40 to \$27.40, according to specification.

Coke.—Moderate sales of prompt furnace coke at \$1.80 at oven are noted. Foundry coke is in fair demand, principally in small lots. Indications are seen of increasing strength in prices of both furnace and foundry grades, owing largely to unsatisfactory working conditions at the ovens. The following range of prices, per net ton, is named for deliveries in buyers' yards in this district:

Connellsville furnace coke.....	\$3.90 to \$4.00
Foundry coke	4.15 to 4.50
Mountain furnace coke.....	3.65 to 3.75
Foundry coke	3.95 to 4.40

Old Material.—Little movement in any of the leading grades is reported. Melters take on small lots to fill out early needs, for which current prices are paid. There has been no business offered in large lots. Borings and turnings are still being diverted to other districts where better prices are available. The demand for heavy melting steel is particularly quiet. Rolling mill grades also show little movement. In fact, both buyers and sellers appear to be awaiting further developments. The following range of prices about represents quotations at which the ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to \$1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap.....	\$12.25 to \$12.75
Old steel rails, rerolling (nominal).....	14.00 to 14.50
Low phosphorus heavy melting steel scrap.....	15.50 to 16.00
Old steel axles.....	18.00 to 18.50
Old iron axles.....	22.50 to 23.50
Old iron rails.....	16.50 to 17.50
Old car wheels.....	12.50 to 13.00
No. 1 railroad wrought.....	15.50 to 16.00
Wrought iron pipe.....	12.00 to 12.50
No. 1 forge fire.....	10.50 to 11.00
No. 2 light iron (nominal).....	6.75 to 7.25
Wrought turnings.....	9.50 to 10.00
Cast borings.....	8.50 to 9.00
Machinery cast.....	13.75 to 14.25
Railroad malleable (nominal).....	11.75 to 12.25
Grate bars, railroad (nominal).....	10.00 to 10.50
Stove plate	10.25 to 10.75

Plates.—Mills are taking considerable small business, but few orders run above 400 tons and the aggregate has not been sufficient, even with specifications on old orders, to increase to any marked degree the operative rate. Good orders for tank plates are in sight and considerable boat business is also pending. On small lots 1.35c., delivered here, is more generally obtained for ordinary plates; on competitive business 1.30c. is, however, still being quoted.

Structural Material.—While there has been a fair demand for plain material and some of the mills have received specifications against recent orders, resulting in a little better rate of operations, new business in fabricated work in this immediate vicinity has been unimportant. Specifications are still delayed for large local building projects. A few small building contracts have been let, but the demand drags. Several thousand tons of bridge work for the Norfolk & Western Railroad have, it is said, been awarded the leading interest. Prices show no change. Efforts to get 1.35c., delivered here, for plain shapes continue, but business can be done at 1.30c.

Sheets.—Business is fairly active, but the bulk of the orders are for small prompt lots. Eastern mills are pretty well supplied with work and continue to operate at full capacity. Western sheets continue to be quoted at 2.05c., delivered, for No. 28 gauge, while Eastern mills, making smooth, loose-rolled sheets, easily obtain 1.75c. to 1.8c. per pound advance.

Bars.—The demand for either iron or steel bars has been rather quiet. Occasional inquiries for 100-ton lots are noted, but the bulk of the sales made have been small. Leading Eastern makers easily obtain 1.27½c. minimum, delivered here, for iron bars, although in other instances slightly less can be done.

Steel bars are held firmly by makers at 1.30c., delivered, although it is reported that merchants who entered contracts with mills at low prices some time ago have shaded that quotation for desirable orders.

Cleveland

CLEVELAND, OHIO, January 16, 1912.

Iron Ore.—Some unsold low grade ore was brought down the lakes last season and placed on dock piles, and sales aggregating about 25,000 tons of this ore have been made during the week. Inquiries for 1912 ore have come from furnace companies, but are generally regarded as market feelers. No intimation is yet being made by shippers as to the probable outcome of the price situation. Ore shipments from docks have been practically suspended because of the intensely cold weather. We quote prices as follows: Old range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; old range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

Pig Iron.—Furnace companies are getting a fair volume of small orders for Northern foundry iron for first quarter and first half delivery. Some small sales of malleable iron are also being made. Sellers are doing a moderate business in small lots of Southern iron. A leading pipe interest is in the market for 25,000 tons of Southern iron for its various plants for early delivery. The market is generally firm. While foundry iron can still be bought at \$13, Valley furnace, for No. 2, most producers are adhering to \$13.25, and a local seller has been able to book small orders for outside shipment at \$13.25 at furnace for No. 2. Shipments are quite good. Many shipping orders were suspended during the holiday season, when inventories were being taken, but shipments on these have been resumed. We quote the following prices for prompt shipment and for first half, delivered, Cleveland:

Bessemer	\$15.15
Basic	13.25
Northern foundry No. 2	\$13.25 to 13.50
Southern foundry No. 2	14.35 to 14.85
Gray forge	12.50
Jackson County silvery, 8 per cent, silicon	17.05

Coke.—The demand for foundry grades has become quite active. A number of contracts have been placed for first half delivery. Prices are firm and some producers have advanced their quotations 10c. a ton. We quote standard Connellsville furnace coke for spot shipment at \$1.80 to \$1.85 per net ton, at oven. Standard Connellsville foundry coke is held at \$2 to \$2.25 for spot shipment and \$2.15 to \$2.35 for contract.

Old Material.—The market has been very dull on account of the cold weather; very little scrap has been moving. Because of the absence of demand, prices are not so firm as they were for the previous week or two, although quotations generally are unchanged. Local mills are not expected to need scrap for some time. They are willing to pay \$11.50 for heavy melting steel, but dealers decline to sell for less than \$12, which appears to be the maximum price at present. The only railroad list this week is the Norfolk & Western, which will close January 20. Dealers' prices, f.o.b. Cleveland, are as follows:

Per Gross Ton.	
Old steel rails, rerolling	\$12.25 to \$12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.75 to 12.00
Old car wheels	12.25 to 12.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.75 to 12.00
Light bundled sheet scrap	9.00 to 10.00

Per Net Ton.	
Iron car axles	\$18.50 to \$19.00
Cast borings	6.25 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	7.25 to 7.75
No. 1 busheling	9.50 to 10.00
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.25 to 11.75
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—Specifications are reasonably good, and a moderate volume of new business is coming out in small lots. However, there is little inquiry for round tonnages. The severe weather has put a stop to outside building operations, so that the demand for steel for small structural work is not active. New structural inquiries during the week, including two medium-sized building jobs, aggregated about 2000 tons. Not much new business in steel bars is coming out, as consumers are mostly under contract; the price is firm at 1.15c. to 1.20c., Pittsburgh. Plates are generally firm at 1.15c. to 1.20c., Pittsburgh, with some mills asking 1.25c. for small lots. Plates under

$\frac{1}{4}$ -in. can be bought at 1.10c. from certain mills making a narrow range of sizes. The 1.20c. price on structural material is being well maintained. The sheet market is firm and some new business is being booked at the higher prices, although consumers generally are covered by contracts. The plant of the Cleveland Steel Company has shut down for engine repairs and will be unable to resume operations within three weeks. The demand for iron bars is rather light; prices are stationary at 1.20c. to 1.25c., Cleveland mill.

Cincinnati

CINCINNATI, OHIO, January 17, 1912.—(By Telegraph.)

Pig Iron.—About 3000 tons of mixed grades of Southern iron was bought by a Kentucky melter for first quarter shipment. A central Ohio manufacturer contracted for 800 tons, nearly equally divided between Northern and Southern brands, for second quarter movement. It is rumored that a nearby rolling mill has contracted for a round tonnage of basic. Aside from these sales, nothing except very small orders has been booked. Foundry stocks are low, a tangible evidence of which is the large number of urgent requests to trace shipments that have been delayed on account of the extremely cold weather prevailing throughout the country. Inquiries are light, and about the largest general one from this section before the trade is that of an Indiana melter for 500 tons of Southern iron for first half shipment. A few local consumers are also in the market for limited tonnages. Prices are unchanged. For first quarter movement \$10, Birmingham, is quoted by a number of producers, but on strictly second quarter business there is a tendency to hold out for a small advance. Northern No. 2 foundry and malleable remain at \$13, Ironton, and contracts would be willingly taken for first half shipment at this price. It is generally admitted that prevailing conditions do not warrant predictions of any early change in the situation. Nellie furnace, of the Marting Iron & Steel Company, blew in January 10. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote f.o.b. Cincinnati as follows for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	\$13.75 to \$14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.45 to 16.95
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.25 to 25.50
Lake Superior car wheel	19.00

(By Mail.)

Coke.—About 7500 tons of 48-hr. Pocahontas coke, for first half shipment, was contracted for by a southern Ohio consumer, and there is a limited demand for the same grade for domestic use. Foundry coke is moving fairly well on contracts, but new business is confined to carload quantities. Contract prices in the Connellsville, Wise County and Pocahontas fields are now about the same, standard furnace brands for future movement bringing all the way from \$1.70 to \$1.85. The shortage in the supply in the Connellsville district has enabled a few producers to get as high as \$1.90 per net ton at oven for spot shipment. Foundry coke is a trifle firmer and is quotable in the three districts around \$2 to \$2.15 for prompt shipment and from \$2.15 to \$2.40 per net ton at oven on future contract business.

Old Material.—The market shows a tendency to sag. Little business is being transacted, with nothing in sight to indicate that the long-anticipated change for the better will take place any time soon. The minimum figures given below represent what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum quotations the selling prices f. o. b. at yards:

Per Net Ton	
No. 1 railroad wrought	\$9.75 to \$10.25
Cast borings	5.00 to 5.50
Steel turnings	5.50 to 6.00
No. 1 cast scrap	10.00 to 10.50
Burnt scrap	6.50 to 7.00
Old iron axles	16.00 to 16.50
Locomotive tires (smooth inside)	11.50 to 12.00
Pipe and flues	7.00 to 7.50
Malleable scrap	7.50 to 8.00

Per Gross Ton	
Bentred sheet scrap	7.00 to 7.50
Old iron rails	12.50 to 13.00
Relaying rails, 50 lb. and up	20.90 to 21.00
Rerolling steel rails	11.00 to 11.50
Melting steel rails	9.00 to 9.50
Heavy melting steel scrap	9.00 to 9.50
Old car wheels	11.00 to 11.50

Finished Material.—Business is seasonably light, but prices are firm. Steel bars are probably in better demand here than any other finished product. The Pittsburgh mill price on bars is 1.15c., and it is conceded by all mill agencies that this is minimum. Plates are quoted at 1.20c., Pittsburgh, though it is probable a desirable tonnage might be placed slightly below this figure for immediate shipment. Local warehouses quote steel bars at 1.60c. and structural material at 1.70c.

Birmingham

BIRMINGHAM, ALA., January 15, 1912.

Pig Iron.—An aggregate of approximately 35,000 tons of foundry grades was added to order books in the past week, which includes some 25,000 tons for export to Austria and to Hull, England. Practically the entire tonnage booked is for prompt shipment, and, accordingly, the situation, especially in certain quarters, is relieved to an appreciable extent. The average selling price received in the week is probably less than was expected, even from the regular trade, as from this last mentioned some tonnage was taken at \$10, Birmingham, by concerns formerly adhering to a basis of \$10.50 for No. 2 Foundry. No sales were reported at higher figures than a basis of \$10, although no advanced deliveries were entered. Of the inquiry pending, mention is made of two lots of 500 tons each for the first quarter; 1000 tons for shipment in the first half and 1000 to 1500 tons in small lots for immediate shipment. Considerably less interest is manifested in deliveries for the last half and producers are not solicitous of such orders. The movement from furnace yards continues at a satisfactory rate comparatively, and it is believed that the increase made in December will be taken care of in this month. Reports favor the blowing out of another stack within the next 30 days, making a total of two stacks to be blown out in 60 days. The month was commenced with 16 stacks producing foundry iron, four stacks on basic and three stacks on charcoal. So far in the month one stack each on foundry iron and on charcoal have been blown out, leaving 20 stacks of the 47 available in operation on this date. We quote the market as quiet, with prices as below being maintained on deliveries in the first half. We quote, per gross ton, f.o.b. cars at Birmingham furnaces, as follows:

No. 1 foundry and No. 1 soft	\$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.00
Standard basic	10.00
Off basic	9.50

Cast Iron Pipe.—The American Cast Iron Pipe Company of this city will furnish the water pipe requirement at Minneapolis, Minn., and at Muskogee, Okla., estimated at 3800 tons in the aggregate. Bids have been submitted on 3500 tons of water pipe for Macon, Ga., which will be awarded January 23, and some 2000 tons of gas pipe for Albany, Ga., is being considered. Inquiry for small lots is being received in fair volume, but the movement to all territory has been very light for the past 10 days owing to unfavorable weather conditions. So far as can be ascertained, ruling prices are about as last quoted, the probable exceptions being in the case of large municipal contracts, where competition is generally very keen. We continue to quote as follows, per net ton, f.o.b. cars here for water pipe: 4 to 6-in., \$23; 8 to 12-in., \$22; over 12-in., average \$21, with \$1 per ton extra for gas pipe. Special fittings are quotable at \$50 to \$55 per net ton at Birmingham foundries.

Old Material.—Receipts at local yards the past week were small comparatively. The forwardings of certain grades were fairly satisfactory without affecting asking prices. There is still very little demand for country wrought and for rails and axles, but a ready market is being found for steel grades and for machinery cast scrap. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles (light)	\$12.00 to \$12.50
Old steel axles (light)	11.00 to 11.50
Old iron rails	11.00 to 11.50
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	6.00 to 6.50
No. 2 country wrought	5.50 to 6.00
No. 1 machinery	8.50 to 9.00
No. 1 steel	8.00 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.50 to 10.00
Light cast and stove plate	6.00 to 6.50

Boston

BOSTON, MASS., January 16, 1912.

Old Material.—The market continues steady with no changes in prices. The dealers are optimistic, no discouraging symptoms having developed. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

Heavy melting steel.....	\$9.50 to \$10.00
Low phosphorus steel.....	11.45 to 11.95
Old steel axles.....	14.00 to 14.50
Old iron axles.....	17.00 to 18.00
Mixed shafting.....	12.75 to 13.25
No. 1 wrought and soft steel.....	11.00 to 11.25
Wrought iron pipe.....	9.25 to 9.50
Skeleton (bundled).....	7.00 to 7.50
Cotton ties.....	7.00 to 7.50
No. 2 light.....	4.50 to 5.00
Wrought turnings.....	5.00 to 5.50
Cast borings.....	4.50 to 5.00
Machinery, cast.....	12.50 to 13.00
Malleable.....	9.25 to 9.75
Grate bars.....	6.00 to 6.50
Stove plate.....	8.00 to 8.50

St. Louis

ST. LOUIS, MO., January 15, 1912.

The second week of the new year sees a maintenance of optimistic opinions and a firm position in prices generally, though there is as yet no tendency to advance. In fact, the disposition even among sellers is to discourage talk of higher prices in the belief that an unjustified increase would be likely to work harm in a recession.

Pig Iron.—The market has been rather quiet during the week though it is known that sales have been brought to a closing point but not reported. Requisitions on contracts continue very good and there is even some anticipation of requirements, showing that consumption is good. Prices stand at \$10 to \$10.50 for No. 2 Southern, Birmingham basis, and \$13 to \$13.50 for Northern, Ironton basis, the range covering terms, shipments, analyses and other conditions. Spot pig in small lots for instant shipment has in some cases commanded a premium the past week, but the conditions were such as to have no bearing on the general market figures.

Coke.—There has been a considerable movement of coke during the week, but little new business. Prices are stiffer on the foundry grades, but furnace coke is without material change.

Old Material.—The scrap market continues in a most uncertain condition. The quotations are higher than consumers want to pay and the dealers are holding firmly in the belief that there is no good foundation for a recession in the figures. The railroad lists continue to be taken at good figures and the Vandalia list of the current week, 300 tons, is expected to go the same way. If the cold weather keeps up consumers are likely to have to give in if their needs press them. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton.	
Old iron rails.....	\$14.00 to \$14.50
Old steel rails, rerolling.....	12.00 to 12.50
Old steel rails, less than 3 ft.....	11.50 to 12.00
Relaying rails, standard section, subject to inspection.....	22.50 to 23.00
Old car wheels.....	13.00 to 13.50
Heavy melting steel scrap.....	11.50 to 12.00
Frogs, switches and guards cut apart.....	11.50 to 12.00

Per Net Ton.	
Iron fish plates.....	\$12.50 to \$13.00
Iron car axles.....	18.50 to 19.00
Steel car axles.....	16.50 to 17.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	10.50 to 11.00
Railway springs.....	10.25 to 10.75
Locomotive tires, smooth.....	14.00 to 14.50
No. 1 dealers' forge.....	8.00 to 8.50
Mixed borings.....	6.50 to 7.00
No. 1 busheling.....	9.50 to 10.00
No. 1 boilers, cut to sheets and rings.....	8.50 to 9.00
No. 1 cast scrap.....	11.00 to 11.50
Stove plate and light cast scrap.....	8.50 to 9.00
Railroad malleable.....	9.00 to 9.50
Agricultural malleable.....	7.50 to 8.00
Pipes and flues.....	8.50 to 9.00
Railroad sheet and tank scrap.....	8.50 to 9.00
Railroad grate bars.....	8.00 to 8.50
Machine shop turnings.....	7.50 to 8.00

Finished Iron and Steel.—Structural orders have been fair. Quick shipment continues to be the demand and the prices remain firm at recent figures. The largest individual item of new business of the week was 300

tons taken by the Cotton Belt from the Indiana Bridge Company. In standard rails inquiries and other developments indicate a reasonably good tendency toward new building in the Southwest during the coming season. In plates there has been some inquiry, though the tonnage has been light. The prices are firm at a range of 1.15c. to 1.20c., Pittsburgh. In bars the specifications have been fair, with quick shipment the feature of the demand. The prices are 1.10c. to 1.15c. Light rails are in better request among the coal companies, due to the severe weather and its effect on the coal demand. Track fastenings have been in fair demand at last quotations, 1.55c.

San Francisco

SAN FRANCISCO, CAL., January 9, 1912.

The coast market for steel products has not yet gathered much impetus, though orders are coming out rather more freely than at the beginning of December, and the outlook is encouraging. In some departments bookings have been heavier than usual at this time, but the general distributive trade shows little life, and merchants expect no great stir until late in the first quarter. Some jobbers are still taking stock, but this work is about complete, and specifications against contracts are beginning to come out in fairly good shape, as supplies on hand are light. Railroads and public service corporations are expected to buy on a large scale within the next few months, and some important inquiries have already appeared from such sources. There is also promise of more activity in structural material.

Bars.—The Pacific Coast Steel Company will start up its new rolling mill at South San Francisco this week. This plant has an annual capacity of 40,000 tons, and will produce open-hearth round, square, cold-twisted and Johnson corrugated bars. The entrance of this new factor into the market tends to unsettle the situation in reinforcing material, though a number of substantial orders have been placed this month. Many new inquiries are coming out, aggregating a heavy tonnage. The distributive trade in soft steel bars is still quiet, but an active movement is expected in the spring, and some of the larger buyers are getting actively into the market. Local re-sale prices do not yet reflect the Eastern advance, standing as before at 2c. for steel and 1.90c. for iron.

Structural Material.—A review of the past year shows a slight gain in San Francisco and Oakland, and a very marked increase in Los Angeles, San Diego and Sacramento, Cal., but a sharp decrease at Portland, Ore., and Seattle, Wash. December, however, was a quiet month in all the larger cities of the coast. Conditions are favorable for an increasing tonnage, but rather in numerous small buildings than in large individual projects, with a large proportionate gain in the smaller cities. Several small local jobs have been let in the past fortnight, but awards are still withheld on the principal buildings on which figures have been taken; and some of the largest jobs, notably the Regents' Hotel, are being figured in reinforced concrete. The only important contract outside of San Francisco is the Hailey-Cobb building at Portland, Ore., let to an Eastern fabricator. The Dick building, 150 tons, has been taken by Dyer Bros. The McClintic-Marshall Construction Company has taken a small job in Nevada and a school at Santa Rosa, Cal., aggregating 160 tons, and Milliken Bros. will fabricate 150 tons for the Benedict apartment house, this city. The United States Steel Products Company has the contract for the Keesing hotel, about 200 tons. The principal new work in immediate prospect is the Hale department store, which will be ready for figuring in a few weeks. Contracts are being let on the Mount Zion Hospital, and figures are being taken on the \$100,000 State arsenal at Sacramento, Cal. Figures will be taken shortly on the Morton building at Third and Howard streets, and a 7-story apartment building at Hyde and Geary streets for J. W. Bryan. Bids will be opened on the Washington State Reformatory January 19. The Garland Theatre at Los Angeles is now being figured, and inquiries are expected soon on several other buildings in that city.

Rails.—The business booked since Christmas is rather above expectations, including several orders for 500 to 1000 tons, and from present indications several other orders of about the same size will be placed before the end of the month. Several interurban roads in the central valley and around the bay have entered the market earlier than was expected, and others in the

same districts, which bought during the fall, are expected to place new orders before April. Several large inquiries for grooved girder rails are coming from street railroads, especially in southern California. So far little has been heard from logging interests, but they should be in the market within another month.

Sheets.—The jobbing movement is still rather limited, but merchants count on a material increase in the requirements of the small trade, and are replenishing their supplies on a fairly liberal scale. Specifications are coming out in good shape from some of the larger manufacturers, who have important contracts to fill in the spring.

Plates.—The general demand from tank and boiler shops is confined to the same narrow limits as for some time, and there are no developments of immediate interest in the oil fields, though considerable business is expected from gas interests later in the season. Marine plates are receiving a little more attention, and a slight increase in tonnage is expected this year.

Merchant Pipe.—There are several large oil line projects which have been contemplated for a year or more, but the outlook for business on this account is very uncertain, and general trade in the oil fields remains dull. Merchants show a little more interest, but the distributive trade has not opened up to any great extent.

Cast Iron Pipe.—Inquiries since the first of the year have been light. The town of Fallon, Nev., is figuring on a complete waterworks system, in which either steel or cast iron pipe may be used. Santa Barbara, Cal., is also planning an extension of its water system, and several orders from gas companies are in prospect.

Pig Iron.—Buying by foundries is extremely light. The disturbance in China has not yet caused any shortage of Chinese iron here, some material being still in transit. The amount of European iron being loaded and in transit for this coast is unusually small, and, while some Southern material is being ordered, the tonnage is of little consequence. Quotations are as follows: Chinese iron, \$23; English and Continental foundry iron, ordinary brands, \$20 to \$22; Southern foundry iron, No. 2, \$20.

Old Material.—Cast iron scrap is almost entirely neglected, and large supplies are accumulating. No large movement has started in other descriptions, but wrought and steel melting scrap and old rails are held with confidence, as a number of rolling mills and steel plants on the coast have little material on hand and are expected to buy heavily. Another 1000-ton foreign cargo of melting scrap will probably be shipped this month. The city of Los Angeles is offering a large accumulation of general scrap from the aqueduct work. Prices are nominally as follows. Cast iron scrap, per net ton, \$14; steel melting scrap, per gross ton, \$11.50; wrought scrap, per net ton, \$12.50 to \$15; rerolling rails, per net ton, \$11.

Buffalo

BUFFALO, N. Y., January 15, 1912.

Pig Iron.—The market, though quiet, has a pronounced undertone of strength. Sales for the week have been light, but inquiries are coming in more freely since the conclusion of inventory taking and it is expected that the present dull period as regards new business will soon be followed with one of more active interest among pig iron buyers. Producers are receiving urgent requests for quick shipments on contracts originally specifying more extended deliveries, indicating that many consumers have been conservative in their purchases and will require additional iron earlier than they anticipated. Prices are noticeably firmer, particularly for prompt shipment orders, on account of the sold-up condition of makers, and schedules have been advanced slightly by the majority of furnaces in this district. We quote as follows for first half delivery, f.o.b. Buffalo:

No. 1 X foundry.....	\$13.75 to \$14.25
No. 2 X foundry.....	13.75 to 14.00
No. 2 plain.....	13.50 to 13.75
No. 3 foundry.....	13.50
Gray forge.....	13.25 to 13.50
Malleable.....	13.75 to 14.25
Basic.....	14.00 to 14.50
Charcoal.....	15.75 to 17.25

Finished Iron and Steel.—The past week has shown in a moderate way a resumption of the buying movement and some contracts have been placed for delivery over the first and second quarters at the higher prices recently established. The feeling among producers and selling agencies is that the fore part of the year at any rate will show a good degree of activity so far as fin-

ished products are concerned and that prices are likely to make a further advance. Business in wire products is keeping up exceptionally well. Some producers report that they are more heavily booked for this season than at any time in their history. In sheets prices have hardened somewhat and specifications on contracts are coming in more freely as inventories close. In fabricated structural lines active conditions continue and prices are stronger at slightly advanced schedules. Most fabricators are busy in their estimating offices and local shops are in many instances filled to capacity for the time being. The Lackawanna Bridge Company has been awarded contract for the steel for the 18-story bank and office building for the Marine National Bank, Buffalo, involving 4200 tons of shapes besides 500 tons of steel piling for foundation work. The Buffalo Structural Steel Company has received contract for 900 tons of steel required for the new factory of the International Auto League Tire & Rubber Company, Buffalo, and the American Bridge Company has secured contract for the steel for the Carborundum company's factory addition at Niagara Falls, 150 tons. The Lackawanna Steel Company has received contract from the Lackawanna Railroad for 7500 tons of structural material, including 5000 tons for the Buffalo terminal station for that road with elevated track entrance. Bids were advertised for last week by the Department of Public Works, Buffalo, for the Bennett Park technical high school building from revised plans of Martin C. Miller, architect, calling for about 600 tons. Plans have been completed and bids will soon be received for the addition to be made to the Monroe County court house, Rochester, requiring a considerable tonnage.

Old Material.—The market is firm and holding its own in all lines, except heavy melting steel, for which the demand has slackened, and the price has dropped 25c. per ton. There has been a slight increase in the volume of inquiry and while there have been no large transactions there has been plenty of movement of small tonnages making a good aggregate. Consumers are apparently a little more anxious to purchase at prevailing prices and are endeavoring to secure short options at to-day's prices to protect themselves on requirements they have in prospect, but dealers are inclined to hold for an advance. The demand for turnings is better, and the price for this commodity has advanced 25c. per ton. Shipments on contracts are going forward in fair volume, there being no slacking in the rate of consumption except for heavy melting steel. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$12.50 to \$13.00
Low phosphorus steel.....	15.75 to 16.00
No. 1 railroad wrought.....	14.00 to 14.50
No. 1 railroad and machinery cast scrap.....	13.50 to 14.25
Old steel axles.....	18.50 to 19.25
Old iron axles.....	22.00 to 22.50
Old car wheels.....	12.75 to 13.00
Railroad malleable.....	12.75 to 13.00
Boiler plate, sheared.....	13.75 to 14.25
Locomotive grate bars.....	11.00 to 11.25
Pipe and tank.....	9.75 to 10.25
Wrought iron and soft steel turnings.....	7.50 to 7.75
Clean cast borings.....	6.75 to 7.00

The German Iron Market

BERLIN, January 5, 1912.—The iron market lost nothing of its activity and firmness during the holiday season and opens the new year with excellent prospects. Up to the end of December the sales of pig iron continued uncommonly brisk and calls for shipment came in rapidly. This week the syndicate has suspended taking new orders, so that it can have time for distributing among the various establishments the business already booked, adjust the unfilled contracts for last year delivery and await the decision of the coal syndicate in regard to the price of coke. It is pretty generally expected that the price will be advanced, and in that case the pig-iron combination will decide also to raise the price of at least some qualities of pig for the second half-year. A decision in this matter will be made about the middle of the month. Meanwhile no orders are to be taken.

Further Advances in Prices

Additional ground for a further advance will probably be found in the fact that the Belgian market continues to send in reports of higher prices. Last week an advance of 2 shillings a ton for basic steel bars and heavy and light plates for export was announced, and yesterday a rise of the home price of basic steel and wrought-iron bars by 2.50 francs was reported. That the price tendency in Germany is still upward is shown by the decision last week by the dealers' association at Düsseldorf to raise bars by 5 marks and plates by 10 marks. According to a telegram of yesterday from

the west German iron district the demand for bars is unusually heavy and export prices have risen to 107.50 marks, which is the highest level for the export trade reached during the present period of prosperity. The mills are fully supplied with orders for bars into the second quarter and home prices are well maintained between 110 and 112.50 marks with even slightly higher prices for quick delivery.

The plate market continues extraordinarily active. Home shipyards are still sending in big orders and there are good prospects for further business from that source, as the large steamship companies continued up to the end of the year to order vessels. The foreign market, especially England, continues to buy German plates in large amounts, but the mills are compelled to reject a considerable volume of such business owing to their inability to deliver in the stipulated periods. The price of tank plates ranges between 127.50 and 130 marks; boiler plates, about 10 marks more.

Syndicates Going to Pieces

The heavy plate convention is about to fall to pieces. Two of the most important companies of the lower Rhine region, the Gutehoffnung-Hütte and the Phönix Company, have withdrawn. They consented only reluctantly to its prolongation last month and so their retirement does not come as a surprise. It is expected that their action will give the death blow to this organization, which was at best a very loosely constructed arrangement. Owing to the great activity of the plate trade the abrogation of the convention will scarcely be felt.

The latest news about the negotiations for the prolongation of the Steel Works Union is also unfavorable. It appears that a deadlock has already been reached. At the meeting on December 19 an effort was decided on to induce all the members to agree to withdraw their new allotment claims in class A products, provided that the great new establishments of Gelsenkirchen at Esch, Thyssen's at Hagendingen and the Burbach combination at Düdelingen would withdraw their applications for allotments in these goods. It has already been found impossible, however, to get the older establishments to promise this, and so it is uncertain what the next move will be.

Germany's imports of iron ores for the first 11 months of last year reached 10,007,000 tons, valued at 164,120,000 marks, which compares with 8,524,000 tons, valued at 139,790,000 marks, for the like months of 1910. In addition to this the imports of manganese ores reached 391,000 tons, against 463,000 tons.

New York

NEW YORK, January 17, 1912.

Pig Iron.—The market has grown even quieter in the past week. The slight improvement in the machinery trade reported in the latter part of December is expected to result in some increase in the melt of foundry iron, particularly in New England, but this is not now a factor in the pig iron market, as buyers seem to be well provided with iron. Eastern Pennsylvania furnaces may get a little business from recent inquiries for basic iron, two of which have developed in the Harrisburg district and one at Philadelphia, but Southern furnaces at the prices they have lately been quoting are likely to share also. The higher quotations recently made by Buffalo furnaces have not been established by actual business, and the supply of iron for Eastern consumption from Virginia and eastern Pennsylvania furnaces, particularly, in the latter case, from steel works furnaces, is such as to preclude any actual advance in this market. Quotations are as follows for Northern iron at tidewater: No. 1 foundry, \$15 to \$15.25; No. 2 X, \$14.75 to \$15; No. 2 plain, \$14.50 to \$14.75. We quote Southern iron at \$15 to \$15.25 for No. 1 foundry and \$14.50 to \$14.75 for No. 2.

Ferroalloys.—Business has been somewhat quiet with New York dealers in ferroalloys, no large transactions being reported. For 80 per cent. ferromanganese \$41 is asked and for 50 per cent. ferrosilicon, \$70.

Finished Iron and Steel.—Business in structural lines as regards large projects lies chiefly in the settlement of pending propositions, as relatively little new work is coming into the market. A widely expressed belief that the hesitancy toward closing contracts is based on an intention to avoid an increase in prices is an indication of the strength of the market. Prices, therefore, remain stationary for steel bars, plates and structural shapes, and it is stated that they are stiffer

for iron bars, though recently at least one carload of refined iron was sold on a basis of about 1.16 $\frac{1}{2}$ c. a mill. Among recent contract awards in structural lines may be mentioned the following, though a few of these have not been authenticated: Three bridges for the New York Central, 300 tons, to the Fort Pitt Bridge Company, which is also credited with the contract for the School of Applied Science, Pittsburgh, 690 tons; Marine Bank Building, Buffalo, 4000 tons, to the Lackawanna Steel Company, which is also understood to have taken a 500-ton building for the Niagara Falls Hydraulic & Mfg. Company; pier for the Central Railroad of New Jersey in New York, 500 tons, to the Heden Iron Construction Company; bridge work for the Norfolk & Western, 2000 tons, to the American Bridge Company, which has also taken a 400-ton bridge for the New Haven at Woonsocket, R. I.; Eastman Kodak Company, Rochester, N. Y., 615 tons, to the Ritter-Conley Mfg. Company; Canadian Pacific shops, Calgary, Canada, for Westinghouse, Church, Kerr & Co., 3500 tons, part to the Canadian Bridge Company and part to the National Structural Company. Bids are to be taken January 25 for 4000 tons of material for the Billerica repair shops of the Boston & Maine. C. T. Wills has the general contract for an 1800-ton structure to be erected on the site of the Hoffman House, Broadway and Twenty-fifth street, and a 1000-ton loft building is to be erected on West Thirty-eighth street, by the A. E. Norton Company. Two other projects of interest to the immediate future are the city hall, Hartford, Conn., 200 tons, and the Poli theatre, Bridgeport, Conn., 300 tons. It is understood that 3000 tons for the Johnson Building, Forty-second street, has been given to Post & McCord. Quotations are: Steel bars, plates and plain structural material, 1.31c. to 1.36c.; bar iron, 1.27c. to 1.32c., all New York. Plain material from store, New York, 1.70c. to 1.80c.

Cast Iron Pipe.—The Department of Water Supply, Gas & Electricity, New York, opens bids today on two contracts for laying water pipe, one of which requires 2500 tons for Brooklyn and the other 1300 tons for Manhattan; Jamestown, N. Y., January 22, on 475 tons; Beverly, Mass., January 23, on 500 tons; Brookline, Mass., January 24, on 275 tons; Lawrence, Mass., January 24, on 200 tons. The city of Grafton, W. Va., which opened bids January 10 for 1280 tons, awarded the contract to the United States Cast Iron Pipe & Foundry Company at \$21.70 per net ton delivered. The volume of business is not so large as it was, but some demand for private work continues to be received by the foundries. Carload lots of 6-in. are quoted at \$22 to \$23 per net ton, tidewater.

Old Material.—A moderate business characterized a portion of the past week. The demand then subsided, and at present neither steel manufacturers nor rolling mills are buying to any extent. Bids are lower, and the outlook appears to indicate further shrinkage in prices. Some of the railroad lists now out are heavier than they have been in the past couple of months. This, of course, does not conduce to the strength of the situation. The purchase is reported of 700 tons of old steam car wheels for export at about \$12.25 per gross ton. Dealers' prices, per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting.....	\$9.75 to \$10.25
Heavy melting steel scrap.....	9.75 to 10.25
Relying rails	20.50 to 21.00
Rerolling rails (nominal).....	12.00 to 12.50
Standard hammered iron car axles.....	19.50 to 20.00
Old steel car axles.....	15.00 to 15.50
No. 1 railroad wrought.....	12.00 to 12.50
Wrought iron track scrap.....	11.50 to 12.00
No. 1 yard wrought, long.....	10.50 to 11.00
No. 1 yard wrought, short.....	9.75 to 10.25
Light iron	4.50 to 4.75
Cast borings, clean.....	6.25 to 6.50
Wrought turnings.....	6.75 to 7.25
Wrought pipe.....	9.50 to 9.75
Old car wheels.....	12.00 to 12.50
No. 1 heavy cast, broken up.....	11.00 to 11.50
Stove plate	8.75 to 9.00
Locomotive grate bars.....	9.00 to 9.50
Malleable cast	9.50 to 10.00

The Western Electric Company is said to be elaborating the theory and practice of operating efficiency in all its departments, employing its own staff of efficiency engineers. As the result of a study of the manufacture of switchboard plugs, the separate operations needed to turn out a plug were reduced from 268 to 208. The study cost approximately \$25,000, but this, it is estimated, will be more than made up through increased efficiency of a single month's operations.

Metal Market

NEW YORK, January 17, 1912.

The Week's Prices

	Copper, New York.	Cents Per Pound for Early Delivery.		Lead	Spelter
		Electro-	Tin, New York.	New St.	New St.
Jan.	Lake.	lytic.	New York.	St.	St.
11.....	14.62½	14.37½	43.25	4.45	6.50
12.....	14.62½	14.37½	43.25	4.45	6.50
13.....	14.62½	14.37½	...	4.45	6.50
15.....	14.62½	14.37½	43.25	4.45	6.55
16.....	14.62½	14.37½	43.00	4.45	6.65
17.....	14.62½	14.37½	42.50	4.45	6.65

Copper is dull with producers' prices firm. Spot tin to-day is a little freer and easier in price. Lead shows no change. Spelter is higher. One brand of antimony is scarce and held at a higher price.

New York

Copper.—The copper market has been dull during the week, a condition which brought out odd lots of the metal for resale at prices lower than the producers have been asking. Not enough was offered by second hands, however, to break the prices asked by the producing interests. Consumers appear to be pretty well filled up for January, February and into March. Electrolytic copper has been sold at from 14.37½c. to 14.50c. and Lake copper has brought up to 14.75c. For Lake 14.62½c. is quoted to-day and for electrolytic, 14.37½c., with some dealers asking up to 14.50c. Attention has been attracted during the week to speculative activity in standard copper in London. Realization in standard contracts caused a flurry on the other side which had an indirect influence in creating a slight tendency toward weakness in this country. The flurry appears to have subsided. The anticipated revival of business is expected to create an increased demand from manufacturing interests which will be sufficient to offset the production of new copper from mines which cannot profitably be operated when copper sells for less than 14c. and whose product is looked for shortly. In London spot copper is quoted to-day at £63 and futures at £63 15s. The exports of copper this month have been 12,486 tons.

Pig Tin.—A fair business was done during the week in tin, but more particularly for February and March delivery. There has been very little tin for spot and nearby delivery and as a consequence a premium has been demanded for an early position. The conditions have been the cause of very little business, only those buying who were confronted with urgent necessity for the metal. A price ½c. lower, or 42.50c., prevails to-day because of the arrival of the Minnehaha yesterday with 800 tons aboard. London prices have jumped both ways during the week. January 11 there was a decline of about £3 and the following day a further drop of £3. January 15 there was a recovery of £6 in London and to-day spot is quoted at £189. Futures to-day are £186 15s. The arrivals so far this month are 1890 tons and the amount afloat is 1565 tons.

Tin Plates.—Practically no change came to the tin plate market during the week. Most of the canners' contracts for the first half of the year are closed and some have bought to cover the entire year. Some consumers held off until after inventory had been taken, but now have been or soon will be in the market. From February 1 on shipments from the mills will be heavy. The price of 100 lb. coke plates in New York remains at \$3.64 and the price of tin plates laid down at Swansea, Wales, is unchanged at 13s. 7½d.

Old Metals.—The demand has subsided and the market is now quiet. Dealers' selling prices are maintained as follows:

	Cents per lb.
Copper, heavy and crucible.	13.50 to 14.00
Copper, heavy and wire.	13.25 to 13.50
Copper, light and bottoms.	12.00 to 12.25
Brass, heavy.	9.25 to 9.50
Brass, light.	7.25 to 7.50
Heavy machine composition.	11.25 to 11.50
Clean brass turnings.	8.75 to 9.00
Composition turnings.	9.50 to 10.00
Lead, heavy.	4.25
Lead, tea.	4.00
Zinc, scrap.	5.25

Lead.—No changes of any importance have occurred in lead, the metal being dull but firm, 6.45c. being quoted in New York and 6.35c. in St. Louis.

Spelter.—In the last few days spelter has shown an upward tendency in price which is attributed to scarcity. Some brands are not to be had in this market for prompt shipment. The cold weather has curtailed production which also has been reflected in prevailing prices. In New York spelter is quoted to-day at 6.65c. and the St. Louis price is 6.50c.

Antimony.—A scarcity of Hallett's has caused that brand to become much stronger. It is quoted to-day at 7.65c. Cookson's is quoted at 7.50c. and Hungarian and Chinese grades at 7c. to 7.12½c.

Chicago

JANUARY 16.—A temporary lull seems to have followed the heavy buying in copper, but, while prices are in a measure nominal, they are firmly held and the seller's position is strong. In other metals few changes are to be recorded, and trading generally was light. We quote at Chicago as follows: Casting copper, 14.50c.; Lake, 14.75c., in carloads for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, carloads, 44.50c.; small lots, 40.50c.; lead, desilverized, 4.40c. to 4.45c., for 50-ton lots; corrugating, 4.55c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.50c. to 6.60c.; Cookson's antimony, 8.75c., and other grades, 7.75c. to 8.25c., in small lots; sheet zinc is \$8.25, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount, in carloads of 600-lb casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 11.75c.; copper bottoms, 10.75c.; copper clips, 11.50c.; red brass, 11c.; yellow brass, 8.50c.; lead pipe, 4c.; zinc, 4.25c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 38c.

St. Louis

JANUARY 15.—Increasing strength is shown in spelter, due to the cold weather which is cutting off the ore production. The quotation to-day is 6.50c. and strong at that figure. Lead is better than last week, but a little easier than on Saturday, to-day's quotation being 4.35c. to 4.37½c. Tin is a shade off from a week ago, at 43.35c. Lake copper is stronger than ever at 14.80c. and electrolytic copper is firm at 14.65c. Cookson's antimony is a little off at 8.10c. In the Joplin district the production of ores the past week was cut fully 75 per cent. by the cold weather. Buyers found it almost impossible to fill their requirements. Even after getting it, it was difficult to handle it, and in consequence shipments to the smelters were light. Zinc blonde brought as high as \$50 per ton; the basis ranged down to \$42 on low grade. Calamine brought from \$22 to \$26 per ton, with choice lots reaching \$30 and very little obtainable. Lead production was at a minimum with the price ranging from \$56 to \$60 per ton. On miscellaneous scrap metals we quote as follows: Light brass, 4.50c.; heavy brass and light copper, 8.50c.; heavy copper and copper wire, 9.50c.; zinc, 3.50c.; pewter, 20c.; tin foil, 29c.; lead, 3.50c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, January 17, 1912.

The force of the favorable influences prevailing for the early part of the month appears to have lost its edge, and prices of stocks are on a somewhat lower plane. No specially depressing features have cropped up, however, and the market seems to be steady. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	%- 1%	Nat. En. & St., pref....	9434
Allis-Chalm., pref....	6½	Pittsburgh Steel, pref....	101½
Baldwin Loco., pref. 103½-103½		Pressed Steel, com...	32½- 33½
Beth. Steel, com.... 30%- 31		Railway Spring, com.	30½- 30½
Beth. Steel, pref.... 60- 61½		Railway Spring, pref....	101
Can., Com..... 11½- 12		Republic, com.....	25½- 26
Can., pref..... 91½- 92½		Republic, pref.....	85- 85½
Car & Fdry., com.... 52½- 53		Pipe, com.....	16
Car & Fdry., pref.... 115½-116½		Pipe, pref.....	47½- 50
Steel Foundries..... 33		U. S. Steel, com.... 65½- 67½	
Colorado Fuel..... 26%		U. S. Steel, pref.... 110½-111½	
General Electric..... 157½-160½		Westinghouse Elec.... 69½- 74	
Gr. N. Ore Cert.... 39½- 42		Va. I. C. & Coke..... 75	
Int. Harvester, com. 107½-108½		Am. Ship, com.... 50½	
Int. Harvester, pref.... 120½		Chic. Pneu. Tool.... 48- 49	
Int. Pump, com.... 30%- 32		Cambria Steel..... 42½- 43½	
Int. Pump, pref.... 82- 83		Lake Sup. Corp.... 28- 29	
Lackawanna Steel.... 30- 30½		Pa. Steel, pref.... 101½	
Locomotive, com.... 33½- 35		Warwick..... 11- 11½	
Locomotive, pref.... 103		Crucible Steel, com.... 12½	
Nat. En. & St., com. 14- 14½		Crucible Steel, pref.... 83- 83½	

A special meeting of stockholders of the Westinghouse Air Brake Company will be held at Wilmerding, Pa., March 20, to vote on a proposed increase in the capital stock and to adopt proposed amendments to the by-laws. The object of increasing the stock is to enable the directors to act on a motion to distribute a portion of the surplus in the form of a stock dividend. The capital stock of the company is now \$14,000,000. Two new directors have been elected, Walter D. Uptegraph and Cyrus S. Gray of Pittsburgh, making 11 in all.

Dividends Declared

The Torrington Company, regular semi-annual, 4 per cent. on the common stock, payable February 1.

The McCrum-Howell Company, regular quarterly, 1½ per cent. on the preferred stock, payable February 1.

The Harbison-Walker Refractories Company, regular quarterly, 1½ per cent. on the preferred stock, payable January 20.

The J. G. Brill Company regular quarterly 1¾ per cent. on the preferred stock, payable February 1.

Personal

F. W. Ballard, secretary of the Cleveland Engineering Society, Cleveland, Ohio, has been appointed by Mayor Baker of that city as constructing engineer of the proposed municipal lighting plant. At present he is manager of the engineering and constructing department of the Sherwin-Williams Company, Cleveland.

Guy J. Stock, Darlington, England, arrived in New York last week and will spend several weeks in this country in the interest of the Stock converter process for steel castings.

Charles M. Lyle, for several years with Manning, Maxwell & Moore, in charge of their Southwestern territory, has resigned to accept the management of the St. Louis office of the Niles-Bement-Pond Company, located at 516 North Third street in that city.

John P. Cowan, journalist, has been added to the publicity forces of the Industrial Development Commission, Pittsburgh, and will furnish news from the commission to the daily press and trade papers.

D. S. Mathias, superintendent of rolling at the South Works of the Illinois Steel Company, left Chicago, January 12, to spend the winter in California.

S. S. Porter has been appointed superintendent of the Calumet Steel Company, Chicago Heights, Ill., in charge of operations, succeeding J. J. Worker, who resigned December 31.

Charles W. Goodnough, formerly Pittsburgh representative of the Prizer-Painter Stove Company, Reading, Pa., has resigned to assume the office of second vice-president of the Stove & Range Company of Pittsburgh, Pittsburgh, Pa.

Arthur E. Woolsey, formerly general superintendent of the plate and slabbing mill at the South Works of the Illinois Steel Company, South Chicago, has resigned to become general superintendent of the entire plant of the Tata Iron & Steel Company, Ltd., at Sakchi, India, which is about 150 miles from Calcutta. The main offices of the company are at Bombay, India.

E. A. Langenbach, president and general manager of the Berger Mfg. Company, Canton, Ohio, has returned from Europe. While in Germany he enjoyed a trip in a Zeppelin dirigible airship.

W. C. Francis has been appointed secretary and manager of the Employers' Association of Oregon. The office was last held by Herman S. Hastings, who resigned more than a year ago. Mr. Francis was formerly connected with similar work in Portland, Ore.

William J. Coane on January 16 assumed the position of second vice-president of the Ajax Metal Company, Philadelphia, Pa. He will also act as its sales manager. He retires from a congenial connection with the Joseph Dixon Crucible Company as its Philadelphia branch manager, having been more than 25 years in the service of that company.

John Calder, manager of the Remington Typewriter Works, Ilion, N. Y., gave an address on "The Manufacturer and Industrial Safety" at the City Club, Philadelphia, January 13.

B. B. Quillen, vice-president and general manager Cincinnati Planer Company, Oakley, Cincinnati, Ohio, left this week for a month's pleasure trip to the Pacific coast, part of which time will be spent at Vancouver, B. C.

Thomas J. Bray, president Republic Iron & Steel Company; Thomas McDonald, general superintendent Ohio works and blast furnaces of the Carnegie Steel Company, Youngstown, Ohio, and W. A. Thomas, president Thomas Steel Company, Niles, Ohio, have been elected directors of the First National Bank and the Dollar Saving & Trust Company, Youngstown.

D. W. Patten, who was for several years salesman for Schuchardt & Schutte, New York, and for the past year with the Marshall & Huschart Machinery Company, Chicago, is now with the Windsor Machine Company, Windsor, Vt., selling Gridley automatics in Ohio.

De Forest Sheet & Tin Plate Company Extensions

The De Forest Sheet & Tin Plate Company, Niles, Ohio, manufacturer of black and galvanized sheets, black plate, metal roofing and siding, is about to make some extensive improvements. Contracts have been let for a new galvanizing department and its equipment. The department will have six standard galvanizing and Lohmannizing pots and one special Lohmannizing pot for handling heavy job work. The very favorable results being secured by the railroads in the use of Lohmannized sheet steel suggested to them similar treatment of under frames, bridge members and other equipment parts, thus requiring special facilities for their production.

The Lohmannizing and galvanizing equipment will be housed in a building having a steel frame and concrete sides and roof, reinforced by the company's own convolute reinforcement. This building will be 98 x 300 ft., and 32 ft. high to top of crane rail, and will be covered by a 30-ton traveling crane. All pots will be heated by natural gas and fuel oil, as is now done in the present galvanizing and Lohmannizing department, absolutely uniform temperature being thus preserved at all times in the molten metal as against a variation of at least 100 degrees with coke. The company states that it is this uniform temperature at which it produces its galvanized and Lohmannized sheets that gives them superior tight non-flaking and non-peeling features.

The hot mill department will be increased by the addition of four sheet mills, making 10 mills in all. The company is also contracting for a 1000 kw. low pressure turbo generator, which will be driven by exhaust steam from the mill engine, and the current thus secured will be used in driving the cold mill train and also in furnishing electric power for other departments. New furnaces and other equipment will be added to increase the facilities of the various departments as needed to take care of the enlarged output of the hot mills. It is the intention, although probably not until 1913, to add another hot mill train of 10 mills, of which perhaps 8 will be tin mills. The plant was originally intended for 20 hot mills, and was laid out with that in view.

The Temple Iron Company's blast furnace, at Temple, Pa., which had been idle since February, 1910, was blown in January 10. It had been completely overhauled in the meantime. Its principal product will be foundry iron for the open market, for which it has a capacity of about 1200 tons a week. A good share of the product for the next three months has been sold.

The Staunton Dielectite Rubber Company, Muskegon, Mich., will hereafter be known as the Vulcanized Products Company and its dielectric material, called dielectite, will be renamed gohmak. The company manufactures molded insulation for high and low tension and rubber compound products. Sheet gohmak from 1/16 in. to 1 1/12 in. thick is carried in stock for quick shipment.

The bi-monthly wage settlement of the bar iron mills between the Amalgamated Association and the Western bar iron mills was made this week on the basis of a 1.20c. card, which means that wages of puddlers and finishers for January and February will be on the basis of \$5.50 per ton, which has been the rate since September.

Obituary

The Late Richard T. Crane

A portrait of the late Richard T. Crane, president of the Crane Company, Chicago, is given herewith. Mr. Crane died January 8, aged 80 years, and his obituary was published in last week's issue of *The Iron Age* on page 147.



RICHARD T. CRANE

The will of Mr. Crane, filed January 15, at Chicago, is said to dispose of an estate valued at \$10,000,000. It provides \$1,000,000 for a pension and disability fund for employees of the Crane Company. Another million is to be devoted to the establishment of homes, near Chicago, for widows or deserted wives, with helpless children. The sum of \$100,000 is given to the United Charities of Chicago for the establishment of the Mary Crane Nursery, \$25,000 to the Visiting Nurses' Association for an endowment, and \$10,000 for establishment of a fresh air home at Lake Geneva. Charles R. Crane and Richard T. Crane, Jr.—two sons—are appointed executors, and inherit the bulk of the estate. In addition to provisions made for Mrs. Crane by ante-nuptial agreement, Mr. Crane left her in possession of the two family residences. The will also directs that the sons pay to Mrs. Crane \$15,000 a year for life.

Franklin Farrel

Franklin Farrel, president Farrel Foundry & Machine Company, Ansonia, Conn., died January 10 after a short illness, aged 84 years. He was Ansonia's pioneer manufacturer and one of its oldest and most highly esteemed citizens. He was born at Waterbury, Conn., and inherited engineering ability from his father, Almon Farrel, who was famous throughout the Naugatuck Valley as a millwright, engineer and builder.

Franklin Farrel was the oldest of seven children, and spent the early days of his life on the farm where he was born. He was educated mainly in country schools, but for a few years attended McKenzie's school at West Point, N. Y. When 14 years of age he began to work for his father, learning the trade of a millwright. In December, 1844, he went to Ansonia, then Derby, and assisted his father in constructing the water works and copper mill for Anson G. Phelps. At that time he prepared a map of Ansonia which was the first ever made and is still in the possession of his family.

In 1849 Mr. Farrel became associated in the foundry and machine business in the firm of Farrel & Johnson, into which his father had put \$8000 and S. and S. M. Colburn with Dr. Josiah M. Colburn \$7000. Later, with this small capital, the concern was reorganized under the name of the Farrel Foundry & Machine Company, and Almon Farrel became its president, an office which he

held until his death in 1857. Franklin Farrel then succeeded to the presidency of this company, an office which he held until his death. To-day the capital stock of the company is \$1,200,000. No small measure of the great success which it has attained is due to Mr. Farrel's farsighted management, technical skill, shrewd and judicious judgment and unflagging industry. Early and late he applied himself to this business with enthusiasm and industry unabated by his advancing years.

In 1877 Mr. Farrel went to Butte, Mont., and there, together with his brother-in-law, Achille F. Migeon and a few associates, formed the Parrot Silver & Copper Company, which proved to be a very successful venture. Conspicuous in the development of this company, and in fact of all the other copper properties in that locality was the introduction into America by Messrs. Farrel and Migeon of the so-called Manhes patent for the converting of copper. This invention worked a veritable revolution in the copper industry, and no small measure of the prosperity of the Butte copper industry is due to the enterprise of these two men. In 1899 Mr. Farrel, with his family, sold the control of this company to the organizers of the Amalgamated Copper Company.

With ceaseless activity, and not content with applying his talents to but a few enterprises, Mr. Farrel embarked in the sugar business. For a number of years he owned or controlled at least three different sugar plantations; one in the island of Cuba and two in Santo Domingo. These interests he disposed of in 1901.

For manufacturing Mr. Farrel had a peculiar aptitude and talent. The Bridgeport Forge Company, in Bridgeport, and the H. A. Matthews Mfg. Company, of Seymour, both attracted his attention and enthusiastic endeavor. Every new improvement in methods of production, every worthy and useful invention applicable to his enterprises, engaged his interest and met with his most zealous support.

At his death he was not only president of the Farrel Foundry & Machine Company, but also of the H. A. Matthews Mfg. Company, a director of the Ansonia National Bank, Colonial Trust Company of Waterbury and Seymour Trust Company, a member of the Engineers' Club, Union League Club, American Institute of Mining Engineers, Quinnipiac and Country clubs of New Haven, and the Ansonia and Manufacturers' clubs of Ansonia.

Mr. Farrel was ever interested in his home city and every thing that made for the good and welfare of the community received both his moral and financial support. There is hardly a church or charity in Ansonia but received ungrudging support from him. He leaves a widow, four daughters and one son, Franklin Farrel, Jr., of New Haven.

GEORGE BROOKE, the oldest ironmaster in Pennsylvania in point of continuous business, and said to be Berks County's wealthiest citizen, died, January 15, at his residence in Birdsboro, Pa., aged 94 years. He was one of the principal owners of the E. & G. Brooke Iron Company and was interested in nearly all the other industries in Birdsboro. With his brother, the late Edward Brooke, he established the iron industry in Birdsboro in 1837. Besides the manufacturing of iron and steel, he was interested in anthracite and bituminous coal mines, ore mines and woodlands in Pennsylvania and West Virginia.

EDWARD R. POOL, for many years sales manager of the American Steel & Wire Company in the Mountain district, with offices at Denver, Colorado, died in that city January 4. Before his appointment to Denver he had been connected with the wire trade at Pittsburgh for a number of years.

JOHN SEATON, head of the Seaton Foundry & Machine Company, Leavenworth, Kan., died last week after a short illness. He had been very active in the foundry trade of the West and was also prominent in political circles in his State. He served with distinction in the Civil War, attaining the rank of captain.

JOHN WALTER YOUNG, second vice-president of the Chalmers & Williams Company, Chicago, died at his home in Evanston, Ill., January 14, aged 56 years, as a result of heart disease from which he had been a sufferer for several years. He was born in Brooklyn, N. Y., and was graduated from Brooklyn Polytechnic Institute. He was

vice-president of the old Fraser & Chalmers organization and later became European representative for the Allis-Chalmers Company.

EDWARD D. KIMBALL, president and founder of E. D. Kimball & Co., dealers in heavy hardware, died at his home in Chicago, January 10, aged 63 years. He had been ill for 18 months.

BENJAMIN HAAS, dealer in iron and steel scrap, died at his home in Pittsburgh, January 4. He went to Pittsburgh from Cincinnati about eleven years ago. For some years he had charge of the offices of the Joseph Joseph & Brothers Company in Pittsburgh, and for the last four years was in business on his own account.

The Late George Elliott

The Elliott-Blair Steel Company, New Castle, Pa., states that George Elliott, superintendent of the rolling department of that company, whose death was announced in the issue of *The Iron Age* of January 4, was one of the pioneers of the cold-rolled strip steel industry. He started to work at that business when it was in its infancy, and he was a young man, and his whole life was devoted to the making of cold-rolled steel. He had been employed in the leading steel mills in the Pittsburgh district and in Jersey City, N. J. Locating at New Castle, Pa., in 1891, he engaged in partnership with his brother, Noah W. Elliott, the present head of the Elliott-Blair Steel Company, in the manufacture of cold-rolled steel, and the success of the company is due, in considerable part, to his efforts. His brothers are also most skillful in this line, the advice of Noah W. Elliott being frequently solicited by the leading consumers of cold-rolled steel.

The American Brake Shoe and Foundry Company's Annual Report

The American Brake Shoe & Foundry Company's report for the year ended September 30, 1911, has been made public. The financial results for the year compare as follows with the previous year:

	1911.	1910.
Earnings, after deducting manufacturing, administrative and selling expenses and depreciation, and including other income and earnings of subsidiary companies.....	\$1,028,808	\$1,063,669
Interest	39,542	40,985
Balance	\$989,267	\$1,022,684
Dividends	532,000	447,750
 Surplus	 \$457,267	 \$574,934

The general balance sheet, as of September 30, compares as follows:

	Assets.	Liabilities.
Plants, patents, etc.....	\$7,677,773	\$7,371,169
Miscellaneous securities.....	349,577	271,901
American Malleable Co.....	374,818	374,818
Edgar Allen A. M. S. Co.....	562,500	550,000
Insurance, etc.....	10,433	7,971
Cash	552,049	353,909
Accounts and bills receivable.....	1,414,489	1,503,552
Inventory stores.....	905,998	1,010,199
Manufactured stock.....	338,657	421,467
 Total	 \$12,186,295	 \$11,864,986
Preferred stock.....	\$4,000,000	\$4,000,000
Common stock.....	3,600,000	3,600,000
First mortgage bonds.....	780,000	806,000
Reserve funds.....	585,750	539,308
Accounts payable.....	283,484	419,706
Accrued bond interest.....	3,250	3,358
Surplus	2,933,811	2,496,614
 Total	 \$12,186,295	 \$11,864,986

C. T. Patterson Company, Ltd., New Orleans, one of the largest machinery supply houses of the South, has been appointed New Orleans representative of the estate of Ed. R. Ladew, to handle Flintstone and Turtle brand waterproof belting, etc.

The annual meeting of the New York and New Jersey Branch of the National Metal Trades Association will be held early in February at a date to be fixed by the Advisory Committee. The meeting will be followed by a dinner.

The Warwick-Eastern Steel Lease

The Warwick Iron & Steel Company's stockholders, at a special meeting held at the Philadelphia office of the company in the Real Estate Trust Building, January 16, ratified the action of the board of directors in accepting the offer of the Eastern Steel Company to rent the property of the Warwick Company. A circular letter from President Edgar S. Cook to the stockholders of the Warwick Company says:

"Negotiations have been in progress for some time between your directors and the directors of the Eastern Steel Company in regard to the lease of your plant for a period of 99 years, which includes an option to purchase upon specified terms. The Eastern Steel Company has finally made a proposition which your directors feel that it is to the best interest of our stockholders to accept. This offer practically assures the stockholders an 8 per cent. dividend. The return to the stockholders under the lease will be approximately as follows: 8 per cent. for three years; then a distribution among stockholders of \$250,000, which is equivalent to \$1.66 per share, and after such payment a dividend of 7 per cent. yearly upon the par value of the stock. If the Eastern Steel Company avails itself of an option in the lease to pay an additional sum of \$250,000 at any time before the expiration of five years, there will be another distribution of the sum of \$250,000, making a second payment of \$1.67 per share, and the rate of dividend thereafter will be 6 per cent. upon the par value of the stock."

"The lease also provides that the Eastern Steel Company is to have the option to purchase the property of your company at any time within 15 years at a total price of \$2,000,000; of which, however, the respective payments of \$250,000 before mentioned would be on account. If after the payments by that company, as above, aggregating \$500,000, it should exercise its option to purchase as aforesaid, the stockholders would receive par for their stock at that time, making, with the two payments above mentioned, a total of \$13.33 per share."

"In view of the narrowing market for steel-making irons made in merchant blast furnaces, due to the building of furnaces by the steel companies, and therefore bringing about excessive competition in all grades of pig irons, your directors believe that the stockholders would do well to authorize this lease and option to purchase, which practically assures the equivalent of an 8 per cent. guaranteed dividend."

Foreign Iron and Steel Statistics

The production of pig iron in Russia in the first six months of 1911 was 1,704,000 gross tons, against 1,484,600 tons in the first half of 1910 and 1,407,500 tons in the first half of 1909. The production of manufactured iron and steel was 1,549,000 tons in the first half of 1911, against 1,433,300 tons and 1,280,800 tons respectively in the corresponding periods of 1910 and 1909.

In the first nine months of 1911 the pig iron output of Sweden was 478,300 tons, against 440,900 tons in the first three quarters of 1910. The production of Bessemer ingots was 65,600 tons in 1911 to September 30, against 78,200 tons, and of open hearth ingots 274,700 tons, against 273,300 tons. The exports of iron and steel for the first three quarters of 1911 were 291,500 tons, against 298,700 tons to September 30, 1910.

The production of pig iron in Belgium in the first 11 months of 1911 was 1,919,900 metric tons, against 1,638,380 tons in the first 11 months of 1910, an increase of 281,610 tons. Forge and foundry irons fell off to about 108,000 tons, while the production of Bessemer and basic pig iron increased about 390,000 tons.

Car Surplus Much Larger.—In the two weeks ending January 3 the net surplus of idle cars in the United States and Canada increased from 76,814 to 135,938, which compares with 106,924 one year previous and is the largest total since July, 1911. The surplus of coal cars increased from 35,409 to 64,719, and the surplus of box cars from 23,485 to 35,145.

Pittsburgh and Vicinity Business Notes

On December 27 the seven Carrie blast furnaces of the Carnegie Steel Company, at Rankin, turned out 3213 tons of pig iron. Their total output for December was 90,658 tons, while their output for the entire year 1911 was 898,438 tons, an increase of 22,733 tons over the previous year.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, has received a contract from the Pennsylvania Water & Power Company, McCall's Ferry, Pa., for one 12,000 kw., three-phase, 25 cycle, 116 r.p.m. vertical water wheel generator, which will be one of the largest machines of this type ever built. From the Indiana & Michigan Electric Company, South Bend, Ind., it has received a contract for a large switchboard to take care of four 60-cycle, three-phase, 25,000 volt lines; 12 three-pole electrically operated oil circuit breakers, four electrolytic lightning arresters, and other apparatus.

Max Solomon, Oliver Building, Pittsburgh, who recently purchased the plant of the Shenango Iron & Steel Company at Wheatland, Pa., contemplates turning it into a mill for the manufacture of iron pipe, and plans are now under way with this in view.

The annual meeting of stockholders of the Pittsburgh Emery Wheel Company was held January 11, at which Charles G. Smith was elected president, J. W. Hetzel, vice-president, and Albert W. Smith, secretary and treasurer. The reports submitted by the officers showed that the company had a very successful year, its business in the manufacture of emery wheels being steadily growing.

The Diamond Forging & Mfg. Company, Pittsburgh, is now operating its plant day and night on drop forgings and tubular steel whippetrees, having heavy orders ahead.

It is reported that the Kenton Gas Engine Company, Kenton, Ohio, manufacturer of gas and gasoline engines, is contemplating moving its plant to another location.

The Union National Bank, Clarksburg, W. Va., will erect a 14-story steel building, and has placed a contract with the McClintic-Marshall Construction Company, Pittsburgh, for 400 tons of steel, which will be fabricated at its plant at Pottstown, Pa.

The Witherow Mfg. Company, successor to Vollkommer & Co., Empire Building, Pittsburgh, continuing the manufacture of enamel and enameling materials, will double the capacity of the works at Sheridan, Pa., and has placed a contract with the Bessemer Gas Engine Company, Grove City, Pa., for a gas-driven compressor. The company states that its sales of enamel and enameling materials in 1911 more than doubled any previous year.

The Linde Air Products Company, Farmers' Bank Building, Pittsburgh, has received an order from the Pennsylvania Railroad Company for oxy-coal-gas apparatus for the equipment of a number of its wreck trains. The apparatus is to be used for cutting up steel car wreckage so that it can be handled promptly.

Official orders were issued last week by the Carnegie Steel Company for the starting up of its works at Columbus, Ohio, which embrace two blast furnaces, Bessemer plant, billet and sheet bar mills. This entire plant has been idle for more than four years, having been shut down in the fall of 1907. The main reason for starting it up is to get an output of sheet bars, badly needed by the company to meet heavy specifications now coming in from sheet and tin plate mills. Eleven of the 12 open-hearth furnaces at the South works of the Carnegie Steel Company at South Sharon, Pa., are now in operation, and No. 1 blast furnace at that plant was started recently. The skelp mill is still idle, and may not be started for some time.

The Jones Underfeed Stoker Company, Park Building, Pittsburgh, has completed the installation of stokers to operate ten 200-hp. boilers in the power plant of the Atlantic Refining Company, at Pittsburgh, and has received an order for a stoker for a 200-hp. boiler for the Pennsylvania Casting & Machine Company, North Side, Pittsburgh.

A number of manufacturing concerns in the Pittsburgh district have filed notices at Harrisburg of increases in capital stock and debt. The Verona Steel Casting Company, Verona, Pa., is increasing its capital stock from \$10,000

to \$750,000; Pittsburgh Writing Machine Company, Pittsburgh, debt \$100,000; Union Automobile Specialties Company, Pittsburgh, stock increased from \$10,000 to \$50,000; Blairsville Enamelled Ware Company, Blairsville, Pa., increasing its debt from \$30,000 to \$90,000.

The Pittsburgh Saw Company has taken out a charter under the laws of West Virginia to engage in the manufacture of saws and saw machinery, with a capital stock of \$10,000. It is stated that the company intends to build a plant in the Pittsburgh district.

The Erie City Iron Works, Erie, Pa., has started up the 32 x 42-in. Erie City Lentz engine, installed at the plant of the Superior Steel Company, Carnegie, Pa. This is the first of the large size Lentz double-ported poppet valve steam engines installed in the Pittsburgh district. The engine is direct connected to a 750-kw. Crocker-Wheeler generator and is operating the entire electrical equipment at the Superior Steel Company, including its new industrial railway as installed by the Arthur Koppel Company, Pittsburgh.

The annual meeting of the stockholders of Spang, Chalfant & Co., Inc., Pittsburgh, operating the Etna Iron & Tube Works, Etna, Pa., was held January 15. Directors were elected as follows: C. H. Spang, D. E. Park, Henry Chalfant, D. B. McClelland and A. M. Bell. The directors elected Henry Chalfant, president; D. B. McClelland, vice-president and treasurer; A. M. Bell, secretary, and George Matheson, Jr., assistant to treasurer and general manager of works. A very prosperous year was enjoyed in 1911, and a large sum has been set aside for improvements to existing works to be made this year.

The stockholders of the Harbison-Walker Refractories Company held their annual meeting in Pittsburgh, January 15, at which directors were elected as follows: H. W. Croft, Hamilton Stewart, O. M. Reif, L. C. Turley, J. J. Brooks, Jr., George W. Reese, H. F. Bigler, J. E. Lewis, T. H. Given, R. W. Harbison, T. L. Chadbourne, Jr., Hay Walker, Jr., Hay Walker, William Walker and N. McQuillen. The board reelected the old officers, as follows: H. W. Croft, president; Hay Walker and O. M. Reif, vice-presidents; Hamilton Stewart, secretary, and William Walker, treasurer.

The Jones & Laughlin Steel Company has received a contract from the Rodgers Sand Company, Pittsburgh, for the building of two steel barges, each 26 ft. wide, 135 ft. long and 9 ft. deep. They will be equipped with an inside hopper so that they can be unloaded with a grab bucket. The space between the hopper and the barge is air-tight, and if for any reason the barge should sink it can still be unloaded with the grab bucket, after which the barge will rise to the surface. Any leakage of water that occurs in the air space can easily be forced out by compressed air. Each barge will require about 225 tons of plates and shapes and they will be built in the Jones & Laughlin steel barge yards at Thirtieth and Carson streets, South Side, Pittsburgh.

The Carnegie Steel Company has placed an order with the Allegheny County Light Company for a 500 hp. motor which will be used for driving the 7 and 8-in. mills, straightening rolls, shearing and punching machines and other equipment in the Painter works on the South Side, Pittsburgh.

Among further contracts placed by the Youngstown Sheet & Tube Company for its new open-hearth plant are the following: Westinghouse Electric & Mfg. Company, East Pittsburgh, motors for the mill, mill cranes, charging machines, etc., ranging from 5 to 150 hp., including spare parts; Electric Controller & Mfg. Company, Cleveland, electric controllers; Variety Iron & Steel Works, Cleveland, gas piping and dirt boxes; Raymond Concrete Pile Company, New York City, concrete piles for building and furnace foundations.

The Carnegie Steel Company has had plans under way for a long time for the building of an open-hearth steel works at its Edgar Thomson plant at Bessemer in order to provide a convenient supply of open-hearth steel for rails and other products, but no appropriation has yet been made for this purpose by the United States Steel Corporation. What will be done at the Edgar Thomson plant has therefore not been definitely decided upon, and hence no plans have been made for the building of new works of any kind at Bessemer.

The Machinery Markets

In almost every section of the country the machinery trade has been unfavorably affected by the cold weather and storms of the last few days. Transportation and communication have been hampered to a considerable degree. Just as general, however, is the feeling that prospective business will be sufficient to offset any temporary lull in activity. New York machinery men have done fairly well during the last week. Both buying and inquiries have been of a satisfactory character considering the circumstances. New England is doing better than three months ago. Philadelphia and Chicago have both been quiet, principally because of weather conditions. In the latter city there has been some buying by railroads. Cincinnati has had fewer export orders and does not expect much improvement in this line until March. Cleveland had a quiet week, but sees good sales ahead. Inquiries are more numerous in Detroit and the gas engine builders in that city are getting many orders from the automobile industry. A lessening of activity is reported in the South, also due to unusual weather. St. Louis has many inquiries. The Pacific coast outlook is better than it was this time a year ago and a few good orders for logging equipment have been taken.

New York

NEW YORK, January 17, 1912.

The New York machinery trade experienced a decided betterment in the week just ended, a fact which was especially reassuring inasmuch as the first few days of the year were rather dull. "It looks good, but is slow," was the worst heard among machinery men who discussed conditions. The trade has plenty of inquiries and small orders and there have been a few sales of excellent size. The Delaware & Hudson has placed some orders against a list which it issued December 28 of tools required in its Carbondale shop. This list is in addition to the large one for the Watervliet shop. The New York Central Railroad and the Pennsylvania Railroad have been buying machine tools to meet present needs. A list representing about \$15,000 has reached the trade from a large manufacturing interest and a small automobile company has been a purchaser to the extent of a few thousand dollars. The machinery trade has felt severely the effects of the cold weather of the last week. Not only has outdoor work been minimized, but deliveries have been greatly impeded and New York houses have found communication by telegraph with distant points difficult or temporarily impossible.

The Utica Steam Engine & Boiler Works, Utica, N. Y., is taking bids on the erection of a one-story addition, 45 x 170 ft., to be made to its plant on Whitesboro street. Agne, Rushmore & Jennison, Arcade Building, are the architects in charge.

The Acott Laboratories Company, Buffalo, N. Y., has been incorporated with a capital stock of \$30,000 to manufacture chemicals, to conduct a chemical engineering business and operate a scientific laboratory. The officers of the company are: R. M. Acott, Niagara Falls, N. Y., president; W. S. Garber, Buffalo, vice-president and general manager; A. J. Kuhn, secretary and treasurer. A temporary office has been established at 507 Brisbane Building.

The Empire Mobile Car Sign Company, Buffalo, recently incorporated with \$1,000,000 capital stock, has purchased a site of 15 acres and is having plans prepared for a factory building to manufacture its product. The company will soon be in the market for one 110-volt D. C. generator and a number of light wood and metal-working machines equipped with individual motors. The company's office is at 358 Ellicott square, Buffalo.

The Buffalo Bridge Company has let contracts for its plant at Bailey avenue and the Erie Railroad, Buffalo.

The Royal Music Roll Company, Buffalo, has been incorporated with a capital stock of \$25,000 and will build a factory at Main street and the Erie Railroad, for which a site has been purchased. F. A. Halladay, P. Gottschalk, of Buffalo, and G. Worthington, of Cleveland, Ohio, are the incorporators.

The American Wire & Fiber Corporation, Albany, N. Y., has been incorporated with a capital stock of \$1,000,000. The incorporators are Thomas Byrnes, Thomas Anderson and John E. Anderson.

The McIntosh & Seymour Company, Auburn, N. Y., has been incorporated with a capital stock of \$600,000 and will build and equip a plant for the manufacture of machinery. J. A. Seymour, W. J. Ferry and W. B. Morrison, Auburn, are the incorporators.

The Worlock Stone Company, Sullivan, N. Y., has been incorporated with a capital stock of \$30,000, to

quarry and prepare stone for the market. C. Worlock, H. M. Worlock and B. M. Burke, Canastota, N. Y., are the directors. An equipment of drilling and stone dressing machinery will be required.

The Chase-Hibbard Milling Company, West Water street, Elmira, N. Y., is completing plans for an auxiliary plant which it will build at State and Fifth streets.

The Builders Mfg. Company, Syracuse, N. Y., is having plans drawn for a manufacturing building 80 x 100 ft., two stories and basement, which it will erect in the spring.

The Syracuse Lighting Company, Syracuse, N. Y., has let the contract for the remodeling and enlargement of its lighting plant. M. Phores is engineer in charge.

The Schenectady Illuminating Company, Schenectady, N. Y., will replace the present equipment at its plant at Rotterdam Wells with two electric pumps of 12,000,000 gal. daily capacity. M. Webb Offutt is manager of the company.

The Refrigeration Corporation of Albany has been incorporated with a capital stock of \$3,500,000 and is planning to erect a plant in that city.

The Blaw Collapsible Steel Company, Pittsburgh, Pa., has purchased a manufacturing site at Yonkers, N. Y., and is having plans prepared for a factory building to be erected thereon.

The Endicott Johnson Company, Endicott, N. Y., is having plans prepared for an electric power plant which it contemplates adding to its manufacturing plant.

New England

BOSTON, MASS., January 16, 1912.

Most business houses believe that their hopes of a real improvement in trade will soon be realized. In fact, conditions are already better than many doubters of early December would have believed possible. The expansion of manufacturing capacity is not progressing rapidly, announcements of new plants and additions to old works not being numerous. But it is known that many manufacturers of metal lines have plans for increasing their capacity, which will be announced in the near future, unless some unexpected influence is met to change the prevailing opinion as to the outlook.

The machine tool builders are doing considerably more business than they were three months ago. This is true not only of the more special machinery, but also of standard tools, the builders of which have suffered more than those whose machines are less general in the scope of their product. It is important to note that builders of practically all classes of machinery the products of which come directly to the ultimate consumer report a more active demand.

The labor situation in New England is excellent. The two exceptions are the longshoremen's strike at Boston, which has tied up shipping and caused a good deal of loss and annoyance to shippers, and a strike in textile mills at Lawrence, Mass., due to the putting into operation of a new law restricting the time of employment of women and children to 54 hours a week, a reduction of two hours. Neither employers nor employees like this measure. Owners cannot afford to pay a higher hourly wage and operatives resent the loss of two hours' pay daily. The act affects many thousands of male workers because of the employment in the same works of women and children. Many houses which manufacture metal goods are affected, but, as al-

ready stated, the general situation is good with little danger that the spring will see any material disturbances of manufacturing activity because of labor troubles.

The Standard Rubber & Cable Company, Bridgeport, Conn., manufacturer of insulated wire and special molded work, proposes to add to its manufacturing capacity with the proceeds of the new capital stock, the issue having been increased from \$50,000 to \$250,000. Additional equipment, such as mills, calenders, vulcanizers, etc., will be purchased from time to time as the business develops.

The Beaton & Cadwell Mfg. Company, New Britain, Conn., manufacturer of floor and ceiling plates and other steam specialties, is planning to erect a large addition to its factory, but work will not begin until next spring. No list of equipment which will be required has been prepared.

The American Hardware Corporation, New Britain, Conn., is establishing a chemical laboratory in an addition to the general office building. Hitherto all this work has been done by outside parties and the constituent companies have acted independently. The corporation will hereafter test all material used.

The Worcester Pressed Steel Company, Worcester, Mass., has decided to build a rolling mill. It will be placed in an addition that will duplicate the present main building, which is 100 x 200 ft. The structure will be of wood, two stories. The mill contains at least five sets of rolls. The contract for a two-story office building has been awarded. The space now occupied for offices will be occupied as a tool-making department.

The Grand Trunk Railroad has petitioned the Massachusetts Legislature for right to enter the city of Boston by extending the line which will be built to Providence from Palmer, where it connects with the Vermont Central. The petition also asks the right to build a spur line connecting Worcester and Douglas, Mass., where it would tap the Providence extension. Shippers are very much interested in these projects as their fulfillment would mean increased competition between the transportation companies of New England.

Fred M. Hoadley, Slater Building, Worcester, Mass., has plans for a factory building, 80 x 300 ft., with an ell, 80 x 150 ft., six stories and basement, of slab concrete construction. The plan is to rent the property for manufacturing purposes. An option has been secured on a tract of land on Shrewsbury street, Worcester.

Philadelphia

PHILADELPHIA, PA., January 16, 1912.

Most sellers note the lack of live business that customarily follows close upon the opening of the year. Reports of occasional moderate transactions are heard, but the bulk of the business closed has been of the single tool or small-lot class. Prospective purchasers are still largely engaged with matters pertaining to annual inventories. While the immediate situation does not show any marked betterment, the volume of prospective business is, in some lines, better than it has been for months. It is expected, with the general betterment which appears to be ahead of the iron, steel and general metal-working trades, that a more aggressive buying movement in machine tools is not unlikely.

More favorable reports continue to be heard from manufacturers of machinery as to actual conditions of business during 1911, and while there was room for considerable further improvement, in almost every instance the average was hardly as bad as had been expected. Railroad purchases have been extremely light and little fresh inquiry has developed. Second-hand machinery merchants report business irregular. Some foundries are better engaged, but the improvement is not general.

The Department of Supplies, city of Philadelphia, will take bids until January 22, under Class C, for the furnishing of the supply of inlet and manhole covers and grates required during the current year. Samples and specifications may be seen at the office of Herman Loeb, director, 312 City Hall.

Charles A. Porter, John J. Kocher, John Warta and Benj. R. Debbie, all of Siegfried, Pa., have applied as incorporators for a charter for the Siegfried Motor Company, with a capital stock of \$10,000.

Ballinger & Perrot, engineers, have completed plans and specifications and invited bids for an ice-manufacturing plant to be erected at Forty-third street and Whitby avenue for the American Ice Company. The plant will consist of a condenser and engine house 54 x

78 ft., two stories, and a freezing and distributor house 35 x 100 ft., three stories. The matter of equipment is now being considered by the company.

The A. P. Witteman Company has completed a large portion of the improvements under construction at its plant at Chester, Pa. The extensions to the forge shop and the boiler and engine house have been completed, the boilers and engines installed and a portion of the new forging equipment placed. Work on the new machine shop is progressing, and the company will, in the near future, consider equipment requirements, which will be largely special machinery. Business with the company has been very good and its plant is being operated at full capacity.

The American Pulley Company reports a very fair volume of new business, but orders are mostly small. This concern is operating its plant on full time and has been making good shipments for foreign account, particularly to Germany and South America.

The Energy Elevator Company notes a particular demand for automobile lifts, for both electric and hand-power operation, and ranging from 5000 to 10,000 lb. capacity. Numerous orders for this company's line of hand-power elevators have been received, also orders for special elevators, and the plant has been operating continuously at full capacity, with sufficient business on its books to keep it so engaged for some time ahead.

Hafleigh & Co., manufacturers of fertilizers and bone products, are making an addition 40 x 40 ft. to their plant at American and Somerset streets. The building will be of concrete and brick, two stories. Special machinery only will be required in the equipment of the new addition.

It is unofficially stated that the Pennsylvania Railroad contemplates extensive improvements in connection with its terminal system in the vicinity of its North Philadelphia Station. Increased bridge facilities across Broad street are proposed, and plans under consideration include, it is said, matters in connection with the electrification of some of its suburban service.

The Newton Machine Tool Works, Inc., reports sales during December as being 75 per cent. of normal, and shipments during November and December as about normal. Urgent deliveries at times necessitated the operation of the plant on full time. Orders were fairly well distributed between its various lines of tools, but rarely included more than two machines in one order. Rotary planing machines and cold-saw cutting-off machines for structural and bridge shops were probably in the best demand. Considerable business, both for foreign and domestic shipment, is reported in the Newton rotary planer tool-grinder attachment. During 1911 this company appropriated and expended a large amount in rearranging the location of its machine tools, for quickly and economically routing the work through the shop. Some equipment has been added and the plant is now capable of handling fully 50 per cent. greater volume of business. Among other tools, this company has recently installed a 72-in. planing machine and Lodge & Shipley lathes, and is building for its own use a large four-spindle milling machine and a heavy high-production spur-gear cutting machine.

Chicago

CHICAGO, ILL., January 16, 1912.

The machinery trade thus far this month has been disappointing, but much of the lethargy is attributed to the extreme weather conditions which have been prevailing and to the delays attendant thereto. The Atchison, Topeka & Santa Fe Railroad has taken figures on a 2500-lb. steam hammer and has signified its intention of buying several other tools. The Illinois Central Railroad, on its recent list aggregating in value approximately \$15,000, has bought several tools and is taking figures on the remainder. The purchase of four lathes, a radial drill and a bolt-cutter by a local maker of refrigerating machinery was distributed among three dealers. The further announcements made last week regarding the Pullman Training School lead to the hope that some of this equipment may be bought this year, while this spring is expected to see the placing of orders for the machinery for the Nicholas Senn School.

The Standard Mfg. Company, Chicago, has taken out a permit to build a one and two-story brick factory at 2436 West Fifteenth street.

The Downing Smith Company, Chicago, has been organized to manufacture and deal in electric machinery. The incorporators are Condit Vorhees, Ingvald N. Herrald and Harry D. Erwin.

The Edgar Allen American Manganese Steel Company, Chicago Heights, Ill., suffered a loss by fire to its plant there of from \$10,000 to \$15,000.

The Rene Safety Auto Wheel Mfg. Company, Chicago, has been organized with a capital stock of \$50,000 by John A. Yotte, Charles F. McKay and Jerome E. Evans.

The Diamond Brass Foundry & Machine Company is preparing plans for a two-story factory to be erected at 219 North Curtis street, Chicago.

The Chicago Steel Foundry Company has let the contract for its new crucible steel plant, the cost of which is to be \$25,000. The plant consists of a foundry 130 x 200 ft. and an office building and pattern storage 22 x 152 ft.

Stewart & Clark Mfg. Company, Chicago, is receiving bids on the erection of a one-story forge shop addition 125 x 153 ft. L. G. Hallberg, 154 West Randolph street, is the architect.

F. A. Heckt has let the contract for a three-story factory 70 x 370 ft., estimated to cost \$130,000. It is to be erected at Calumet avenue and Fortieth street.

The W. S. Tyler Company, Chicago, wire-cloth manufacturer, has let contracts for the erection of a one and two-story manufacturing plant at Fifteenth street and South Campbell avenue.

The Walloff Motor Truck Company, Minneapolis, Minn., has purchased a building at Red Wing, in which equipment is to be installed for the manufacture of motor trucks.

The Home Lumber & Construction Company, Reedsburg, Wis., has decided to dismantle its present building and erect a new factory on Main street, to be of concrete construction and equipped with new machinery.

The Baker Mfg. Company, Evansville, Wis., has arranged to build a reinforced fireproof building 66 x 132 ft., from four to eight stories. The building primarily will afford much-needed warehousing space for the increased business of this company.

Scheffler Bros., Milwaukee, Wis., have let the contract for a four-story factory building 50 x 120 ft., to cost \$50,000, which is to be erected at South Pierce and Tenth streets.

J. A. Zieman, Davenport, Iowa, is having plans prepared for a two-story garage and repair shop 30 x 150 ft., to cost \$15,000.

Cleveland

CLEVELAND, OHIO, January 16, 1912.

While not much business has developed so far this year in the machinery trade, the outlook is generally regarded as satisfactory by manufacturers and dealers. The past week has been rather quiet, but some new inquiries for machine tools have developed, and now that inventory season is practically over dealers look for an increased volume of sales. Makers of various lines of special machinery generally report the outlook good. There is a good volume of business in prospect in coal-handling machinery and handling equipment for other purposes. Several hydro-electric projects indicate a good demand for water wheels and the accompanying electrical equipment. A local manufacturer reports considerable improvement recently in the demand for electric drills.

In the foundry trade the demand for light castings shows some improvement.

The Kirk-Latty Mfg. Company, Madison avenue and West Eighty-fourth street, Cleveland, has increased its capital stock from \$150,000 to \$300,000 for the purpose of taking care of the steady growth of its business and to increase the capacity of its plant. Plans will be prepared shortly for some factory additions which will be built during the year. The company makes nuts, bolts, screws, rivets and juvenile vehicles.

The C. O. Bartlet & Snow Company, Cleveland, reports a good volume of inquiries for coal tipplers and coal-handling and conveying machinery and dryers. This company has just taken an order for a large coal tippler with Greene transfer drums and steel head frame. Other good-sized orders recently taken by this company are as follows: Garbage disposal plant for the Reading Bone & Fertilizer Company, Reading, Pa.; dryer for J. H. & L. Stadler Company, Cleveland; four garbage percolators and four cone garbage presses for the New York Sanitary Utilization Company, New York; a brick-drying plant for the Lonyo Brick Company, Michigan; a brick-drying plant for James Cornhill, Chatham, Ontario, and a brick-drying plant for Farr Brothers, Cleveland.

The Wellman-Seaver-Morgan Company, Cleveland, is building for the Mississippi River Power Company seven single-runner vertical-type turbines for the new hydro-electric power plant that is being built at Keokuk, Iowa. These turbines will have a normal capacity of 10,000 hp. each and a maximum capacity of 14,000 hp. each. The runners will weigh 130,000 lbs. each. It is stated that the largest runners now in operation weigh 30,000 pounds.

The New Century Fence Company is a new Cleveland concern that has been incorporated with a capital stock of \$100,000 to manufacture fence machinery and wire fencing. The company has just established a temporary plant at 2617 East Seventy-seventh street, and later it expects to build a new plant. Some machinery will be purchased, including milling machines, lathes, planers, shapers, etc. The officers are: A. C. Davis, president; W. C. Smith, vice-president and general manager; L. A. Davis, treasurer. The company has just received an order from the Dominion Iron & Steel Company, Sidney, Nova Scotia, for 13 of its machines.

The B. & B. Mfg. Company, now located on Cedar avenue, Cleveland, will build a new plant 45 x 75 ft. on Carnegie avenue, near East Sixty-fifth street. The company manufactures wind shields for automobiles. It will be in the market for a gas engine, boiler and probably some machinery.

The Osborn Mfg. Company, Cleveland, has purchased the business and plant of the Colonial Brush & Mfg. Company, 348 Florida street, Milwaukee, Wis., which has been a distributor of the Osborn products. Hereafter the plant will be known as the Osborn-Colonial Works. It will be under the direction of E. F. Streich, as resident manager.

The Humphrey Pipe & Foundry Company, Bellefontaine, Ohio, recently incorporated with a capital stock of \$10,000, will take over the Charles Humphrey foundry in that city. It is the intention to enlarge the plant during the coming spring.

The Reuscher Mfg. Company, Toledo, Ohio, has been incorporated with a capital stock of \$35,000 by Charles A. Reuscher and others to manufacture pipe-threading machinery.

The Yankee Combination-Nozzle Company, Cleveland, has been incorporated with a capital stock of \$10,000 to manufacture combination nozzles and other brass goods. James H. McConkey, Francis J. French and others are the incorporators.

The Pelee Sand & Gravel Company has placed an order with the American Shipbuilding Company, Cleveland, for a sand steamer that will cost about \$80,000. The boat will be 166 ft. long with 37 ft. beam. It will be equipped with a self-unloading device, an electric-light plant and two 12-in. pumps.

Cincinnati

CINCINNATI, OHIO, January 16, 1912.

The extremely cold weather prevailing during the past week, tended to curtail business in almost every line, and machine tool builders report no exception; export orders are also coming in more slowly, but this was expected, and it will probably be well along in March before this particular branch of the business picks up again.

Cincinnati's Building Commissioner's report for 1911 is attracting a great deal of attention. The total estimated amount for improvements is \$13,360,860, several million dollars ahead of any previous year. A large percentage of this amount was for manufacturing buildings, and, considering that the new plants in Oakley, Norwood and other suburbs are not included, this is an extremely gratifying showing.

The magnificent new home of the Ohio Mechanics Institute, in Cincinnati, was formally dedicated last week. The programme provided for exercises beginning the evening of January 8, and extending throughout the week. James Albert Green made the dedicatory address, after which Prof. John L. Shearer presented 70 graduates of the 1911 class with diplomas. James C. Hobart, vice-president of the Triumph Electric Company, presided over the meeting held the evening of the 9th, and Fred A. Geier, president of the Cincinnati Milling Machine Company, introduced the speakers the following evening. The auditorium, built to seat 2200 people, is one of the most handsome in the Central West.

The Superintendents' & Foremen's Club of Chicago has invited all the members of the Cincinnati Branch,

National Metal Trades Association, together with their superintendents and foremen, to attend its annual meeting to be held January 20. A large delegation is expected to leave Cincinnati January 19 to be on hand at this meeting.

The Cincinnati Traction Company expects to begin work on its new shop and barn additions at Winton place, Cincinnati, early in the spring. Details as to the buildings are not yet completed, but it is understood that four of the structures will be 150 x 300 ft., one-story and of brick and steel construction.

The Thompson-Starrett Company, New York, has been awarded contract for the construction of the proposed 22-story office building for the Union Central Life Insurance Company, Cincinnati. As previously mentioned, the building will be erected on the old Chamber of Commerce site at Fourth and Vine streets. Garber & Woodward, Cincinnati, and Cass & Gilbert, New York, were the architects who drew up the plans for this new structure.

The Modern Machine Tool Company, Cincinnati, whose plans were mentioned last week, has increased its capital stock from \$20,000 to \$70,000. It expects to have its Winton place factory in operation within the next 60 days.

The Anchor Brass & Aluminum Company is a new Cincinnati incorporation with \$10,000 capital stock, and is seeking a suitable building in or near Cincinnati for a foundry. The company expects to make all kinds of brass, aluminum and alloy castings. Gustav A. Wendt, formerly with the Ohio Pattern Works, is president and one of the principal incorporators.

The Cincinnati & Hammond Spring Company, operating vehicle spring factories in Cincinnati and Hammond, Ind., has been incorporated under the Ohio laws with \$50,000 capital stock. It is rumored that the company has sold its Hammond plant and will concentrate all its business in its Cincinnati factory. E. V. Verman is president of the company.

The large piano factory of the Knabe Brothers Company, Norwood, Cincinnati, was totally destroyed by fire January 12. Plans are already under way for rebuilding on the same site. The proposed structure will be much larger than the old building.

Bert Baldwin & Co., Perin Building, Cincinnati, have been selected to draw up plans for an immense soap factory to be erected at St. Bernard for the M. Werk Company, Cincinnati.

The Armor Steel Foundry Company, Cincinnati, now has its Winton place plant in full operation. The first heat of acid open-hearth steel was drawn from its 10-ton furnace last week. Frank J. Stolle is sales manager, with offices in the Commercial Tribune Building.

Architect Gustav W. Drach, Cincinnati, has completed plans for the new Gibson House and will soon be ready to receive bids for its construction. A large amount of steel structural material will be required for this work.

The Kentucky Motor Car Company, Covington, Ky., has been incorporated with \$20,000 capital stock and will erect a garage and small repair shop. The incorporators are Paul H. Hesser, Cincinnati, and Paul L. Bethell and William R. Allen, Covington.

The Easy Adjusted Screen Company, Inc., Covington, Ky., has its new plant in operation and is in the market for a form metal-bending apparatus.

The Charles McCaul Construction Company, Philadelphia, Pa., has been awarded contract for the large proposed Federal Building at Dayton, Ohio. The amount of its bid was \$414,581.

H. Ley & Co., Cincinnati, structural and ornamental iron fabricators, have had plans prepared for a large new factory to be erected on Lincoln avenue, near May street. The new building will be of brick, steel and concrete construction.

Indianapolis

INDIANAPOLIS, IND., January 16, 1912.

The International Pneumatic Wheel Company, Indianapolis, has been incorporated with \$100,000 capital stock. The directors are: W. H. Alford, W. S. Johnson, J. H. Dennis, Fletcher Johnson and R. R. Dennis.

A fire at the plant of the Rockwood Mfg. Company, Indianapolis, January 11, caused a loss of \$10,000 to a warehouse containing castings, packed and unpacked. The company manufactures mill machinery. The damage was covered by insurance.

The Deco Veneer Company, Indianapolis, Ind., has increased its capital stock from \$20,000 to \$60,000 for the purpose of enlarging its manufacturing plant.

The Wilcox-Hoyt Mfg. Company, Indianapolis, has been incorporated with \$10,000 capital stock to manufacture electrical devices for automobiles. The directors are: R. A. Wilcox, H. E. Wilcox and F. R. Hoyt.

The Bell Brothers Piano Company, Muncie, Ind., has been incorporated with \$250,000 capital stock to manufacture pianos. The directors are: Olin, J. H. and M. M. Bell.

The Hoosier City Boiler Mfg. Company, Marion, Ind., has been incorporated with \$100,000 capital stock to manufacture boilers, tanks, sheet iron work, etc. The directors are: James M. Broucher, J. I. Stephenson and Major A. Downing.

The Western Construction & Engineering Company, Ft. Wayne, Ind., has been incorporated with \$50,000 capital stock as general contractor. The directors are: G. M. Hofmann, R. P. Hofmann, A. F. Stahlhut, C. S. Bash and F. E. W. Schelman.

The Peru Basket Company's plant at Peru, Ind., was burned January 10, causing \$25,000 loss.

The Simplex Railway Appliance Company, Hammond, Ind., has been incorporated in Delaware with a capital stock of \$1,000,000, certified in Indiana for the full amount of the stock, and will manufacture railroad appliances. H. H. Phillips is president.

The plant of the Shirley Radiator & Foundry Company, Shirley, Ind., was destroyed by fire January 9. The company anticipates immediate adjustment and is planning to rebuild.

Detroit

DETROIT, MICH., January 16, 1912.

A fairly good volume of inquiry is coming out for general mechanical equipment and a continued improvement in conditions is looked for. The usual volume of single-tool sales is noted, but no transactions of particular importance have been reported the past week. The automobile trade is still keeping out of the market, but a number of the large companies have increased their capital stock within the last few months, and it is generally supposed that plant extensions will follow in the near future. Makers of gas engines have a big volume of business in view for the coming year and will probably be large purchasers of machinery. The second-hand machinery trade is quiet. The foundry situation shows little change, conditions continuing satisfactory. The year has opened well in building circles and structural material fabricators expect to be actively engaged during the spring.

The Federal Motor Truck Company has purchased the plant and equipment of the defunct Van Dyke Motor Car Company at Junction and Leavitt avenues. The site comprises three and one-half acres, and there is now on it a building 60 x 512 ft., with sufficient room for the erection of two more buildings of equal dimensions, thus providing for future extensions.

Frederick Stearns & Co., manufacturer of drugs, has increased its capital stock from \$1,000,000 to \$2,000,000. The company is planning a small addition to its Walkerville factory.

The Dake Engine Company, Grand Haven, Mich., maker of pneumatic hoists, steam and air engines, has increased its capital stock from \$20,000 to \$80,000.

Negotiations are being carried on for the consolidation of the Queen City and Boardman River Power Companies, Traverse City, Mich. The plans call for the construction of a new power dam on the Boardman river.

The Grand Rapids-Muskegon Power Company, Grand Rapids, Mich., will erect a sub-power station near Kent City, Mich.

The Piston Ring Company, Muskegon, Mich., has been organized by Charles E. Johnson and Paul J. Beardsley, and will engage in the manufacture of piston rings for motors. A shop is now being equipped.

The Oriel Furniture Company, Grand Rapids, Mich., will enlarge its plant by the erection of an addition 60 x 200 ft. and five stories, to cost \$35,000. The work on the new building will begin at once.

The Hess-Pontiac Spring & Axle Company, Pontiac, Mich., has decided to discontinue the manufacture of axles, and will replace its axle machinery with equipment for the manufacture of automobile springs exclusively. The capacity of the plant will be increased about one-third.

The Panwood Mfg. Company, Grand Rapids, Mich., has been incorporated with \$60,000 capital stock, by F. Z. Pantlind, H. B. and R. G. Woodcock. The new company will manufacture and deal in automobile accessories of all kinds.

The Falcon Mfg. Company, Big Rapids, Mich., has

awarded contracts for the erection of a large sawmill in that city.

The Grand Rapids Lumber Company, Grand Rapids, Mich., is receiving bids for the construction of a power plant in connection with its new factory now in process of erection.

The Krit Motor Car Company, manufacturer of automobiles, has filed amended articles of incorporation, increasing its capital stock from \$250,000 to \$500,000.

The Jackson Brass Foundry Company, Jackson, Mich., has acquired the plant and business of the Wolverine Aluminum Brass Foundries, also of Jackson, and the Wolverine corporation will be dissolved. In addition to operating the new plant, the company will also enlarge and modernize the equipment of its old plant. W. W. Wright has been elected president and Joseph Gerson secretary of the combination.

The Auto Axle Company, Grand Rapids, Mich., has been incorporated with a capital stock of \$24,000, to manufacture automobile accessories. The incorporators are Palmer A. Jones, Al Walther and Louis M. Jones.

The Kalamazoo Corset Company, Kalamazoo, Mich., has commenced the erection of a large branch factory at Davenport, Ia.

The Farmers' Handy Wagon Company, Saginaw, Mich., has increased its capital stock from \$150,000 to \$300,000 to take care of rapidly increasing business.

The South

LOUISVILLE, Ky., January 16, 1912.

Trade has been greatly interfered with by extremely cold weather, and blizzards all over the Southern territory tying up transportation and paralyzing traffic of all kinds. Manufacturing plants are continuing to operate, but report orders light. Dealers are doing comparatively little, the cessation of construction work of all kinds cutting off an important source of demand.

An interesting illustration of the relation of business to natural conditions is being presented by the situation in the ice machinery field. Last summer was long and hot, and ice factories, in the South especially, found themselves unable to supply the demand. During the past three or four months they have been ordering new equipment, and other concerns have been organized to build factories. The makers were flooded with inquiries and booked many actual contracts. The almost unprecedented cold wave, which covers the entire South, has created an immense supply of natural ice, which is being cut and stored. Prospects for new ice companies are therefore shattered, and inquiries and orders have ceased absolutely, according to those connected with this business. They are still running full time on old orders, but expect little business from the South for the rest of the season.

C. J. Walton & Son, Louisville, have installed a 150-hp. boiler in the plant of the Frey Planing Mill Company, Louisville. This concern has also completed the installation of a considerable amount of equipment furnished by the J. A. Fay & Egan Company, Cincinnati.

R. O. Rubel, Jr., & Co., Louisville, have been incorporated with \$35,000 capital stock for the purpose of manufacturing aeroplanes. The company has been doing business for some time and has a small shop. It is likely that this will be enlarged.

The James Clark, Jr., Electric Company, Louisville, has sold Bridgeford & Co., Louisville stove founders, a full motor equipment for their plant. Twenty-nine motors, having an aggregate power of about 200 hp., will be installed. This is the fifth stove foundry in Louisville which is now operating its machinery with electric motors.

Buildings for its new plant are to be erected by the Olive Hill Fire Brick Company, Olive Hill, Ky. The contract for their erection has been let to the McClinic-Marshall Construction Company, Pittsburgh. The structures will involve the use of 300 tons of structural steel.

Important steel work which will be in the market during the next few years is involved in the immense gates for the new lock which is to be built at Louisville by the United States Government in connection with the general plan for the canalization of the Ohio River. The masonry and excavation for the locks will cost over \$1,000,000, a contract having been let several months ago. This work will take three years, and following it contracts will be let for the gates, which will be entirely of steel, and for the large amount of power equipment which will be needed to operate them. The work of canalization, which was begun in 1900, will be completed in 1922. The total cost of the work will be

\$64,000,000, a large part of which will have been expended for structural steel and machinery.

James P. Lewis, Union Bank, Whitesburg, Ky., is in the market for some woodworking equipment, including a sticker and moulder.

The Brush Creek Mining & Mfg. Company, Warren, Ky., will be in the market for a lot of general equipment, including air compressors, motors, etc., about March 1. The company is opening some new mines and plans to increase its capacity to 600 tons a day. R. L. Wheeler is general manager of the concern.

The building and general machinery of the Maysville Foundry & Engineering Company, Maysville, Ky., has been sold to the Mason Lumber Company, of that city, which will equip it for use as a flooring mill.

The Lexington Hydraulic & Mfg. Company, Lexington, Ky., has announced that it is contemplating the expenditure of a large amount of money for new equipment and other improvements. Plans are now being drawn and work is to be begun early in the spring.

Milliken & Aldridge, Jackson, Ky., has purchased a large mill of the Ohio Valley Tie Company, Louisville, and will enlarge and improve it. It has not been in operation for some time. The erection of another sawmill by this concern is contemplated.

The National Toilet Company, Paris, Tenn., has purchased a building and will remodel it for manufacturing purposes.

The Tennessee Creosote & Shingle Roof Company, Knoxville, Tenn., will build a plant in Lonsdale, a suburb. W. W. Massey is in charge. A similar plant is to be erected at Chattanooga, Tenn., by R. L. Moore and others.

Joseph Jordan will establish a handle plant of large capacity at Jackson, Tenn., it is reported. Address W. P. Moore, secretary Merchants' Association.

The Union Ice Cream & Sanitary Milk Company, Nashville, Tenn., announces that it will install modern machinery for the pasteurization and handling of milk and other dairy products.

Jellico, Tenn., has voted in favor of a municipally-owned waterworks system, and a \$100,000 plant is to be erected as the result of an election January 6. S. D. Moore is Mayor.

The Ohio Valley Pulley Works, Maysville, Ky., has been incorporated with a capital stock of \$50,000 by E. P. Browning and others. The company is now operating a large plant for the manufacture of wooden pulleys, and the incorporation will probably not require any changes in the plant.

McDonald Bros. and W. D. Harmon, Rogersville, Tenn., have purchased the plant of the Rogeraville Electric Light Company and will make improvements. It is intended to erect a hydroelectric power plant on the Tennessee River, retaining the present plant for emergency purposes only.

The Blue Pearl Granite Company, Winston-Salem, N. C., is in the market for electrical equipment, including 20 to 40 hp. dynamos, in addition to a stone lathe of moderate capacity.

J. J. Ivey, Guntersville, Ala., has sent out inquiries for a new or second-hand rock-crusher, with a capacity of five cu. yd.

The Bentall Machine Company, 803 Washington street, Suffolk, Va., is in the market for a 42-in. lathe.

C. E. Stewart, Atlanta, Ga., who has purchased 4000 acres of timber near Mobile, Ala., will organize a company and erect a sawmill for the development of the property.

The boiler and machine shops of the St. Louis Southwestern Railway at Pine Bluff, Ark., which were recently destroyed by fire, are to be rebuilt, it is reported, at a cost of \$50,000.

The Patton Aeroplane Company, Birmingham, Ala., has been incorporated with \$60,000 capital stock for the purpose of manufacturing flying machines. M. F. Patton, John L. Tyler and others are the incorporators.

The plant of the Gibbes Machinery Company, Columbia, S. C., was destroyed by fire, which also burned several adjoining buildings. The company specialized in motor construction, handling other work as well however.

Columbus, Ga., may issue \$350,000 of bonds for the erection of a water plant.

Henry R. Worthington, New York, has been awarded the contract for the pumps and compressors for the new water-works system of Jesup, Ga. The General Pipe & Foundry Company, Atlanta, got the contract for the 300 tons of pipe to be laid; the Columbian Iron Works, Chattanooga, Tenn., will cast the valves and hydrants, and the Westinghouse Electric Company, East Pittsburg, Pa., will furnish a 75-kw. alternator.

St. Louis

ST. LOUIS, Mo., January 13, 1912.

The machine tool market has shown no appreciable change in the matter of the closing of transactions, but inquiries are fair, all things considered, and the evanescence of these is considered likely to result in some good business before long. The extreme weather which has prevailed continuously the past ten days has been responsible for some of the slackening of business.

The Light & Development Company, St. Louis, Hugo Wurdack president, has purchased control of the Poplar Bluff Lighting Company and also of the Cape Girardeau Water & Light Plant, and announces plans for considerable improvement in their mechanical equipment.

The plans for the new Barr block in St. Louis, which is to be 21 stories, contemplate the installation of 18 elevators to run the full height of the building and 20 elevators to run only seven stories and basement.

A site has been purchased for the recently announced \$250,000 mutual brewery of the St. Louis Retail Grocers, and the structures and equipment will be rushed forward as rapidly as possible. The mechanical equipment is to be of the latest type.

The A. Chisholm Machinery Company has leased new quarters for the extension of its equipment for the repair, overhauling and manufacture of elevator machinery.

The Francis & Ogden Wax Company, St. Louis, with \$30,000 capital stock, has been incorporated by Thomas and T. T. Francis, C. W. Greve, Jos. Dickson and K. R. McDonald, and will install a plant for the manufacture of wax at Cuatro Cienegas, Coahuila, Mex.

The Mercantile Box & Label Company has been organized with \$100,000 capital stock by J. H. and R. D. Ewing, E. C. B. Palmer and R. N. E. Williams, and will install a plant for the manufacture of paper boxes.

The Eagle Packet Company, St. Louis, Henry Leyhe general manager, has announced that it will build at once a river boat to cost \$100,000, and that it will be in the market shortly for marine engines and other equipment. The engine cylinders are to be 22 in. diameter with 8 ft. stroke; the boilers 44 in. x 26 ft.

The St. Louis & Tennessee River Packet Company announces plans to build two river boats, one to cost \$50,000 and the other \$20,000, both requiring marine engine equipment. The St. Louis offices are under the direction of Capt. John E. Massengale, secretary and treasurer.

The George W. Johnson Mfg. Company, Kansas City, Mo., has bought a three-story building in St. Louis and will remove from Kansas City at once. It will enlarge its mechanical equipment. The company manufactures fireproof doors and fire escapes.

The Commercial Acid Company's plant, just south of East St. Louis, was burned the past week, as was also a part of the Sandoval Zinc Works. Both will be rebuilt and re-equipped with machinery. The total cost of re-establishment will be about \$125,000.

The Iron Mountain System of the Missouri Pacific Railroad has begun construction of a \$75,000 20-stall roundhouse at Argenta, Mo.

The Chicago, Rock Island & Pacific Railroad has provided for the erection of a new 10-stall roundhouse at Topeka, Kan.

The Pacific Coast

PORLAND, ORE., January 9, 1912.

Buying of machine tools has been resumed on a rather limited scale, business in all lines being somewhat interrupted by weather conditions at the moment. The outlook for the spring, however, is highly encouraging. A few definite inquiries of some importance have come out within the last week, and the volume of business considered practically in sight is considerably greater than at the same time last year. Those who control the larger shipbuilding and general machine plants of this territory show a disposition to proceed with improvements which have been under consideration for some time, and buying on the part of railroad interests will be a factor of some importance, several railroad lists being due to appear very shortly. It is by no means certain that the movement will continue throughout the year, but machinery agents and merchants feel assured of a period of activity for the next two or three months.

A few substantial orders for logging machinery have been placed, and inquiries are expected within the next month or two for considerable railroad equipment for logging interests, though the bulk of the business is of

a rather scattering nature at present. Small orders for mill and general woodworking machinery are coming out in good shape, and the movement of canners' equipment is fully up to expectations, though most orders from the Alaska fishing interests have by this time been placed. Dealers in irrigating and agricultural machinery are preparing for an extremely active season during the spring.

Plans of Claussen & Claussen, local architects, for the projected Machinery Building have been approved by the owners, a syndicate of Portland and Chicago men, most of whom are identified with the machinery business. The building will be of reinforced concrete, seven stories, on the block bounded by First, Second, Ash and Pine streets, and will, according to present plans, be occupied exclusively by the branch offices and salesrooms of Eastern machinery, belting and supply houses.

The Portland Railway, Light & Power Company will next summer install in its North Portland plant a 10,000-kw steam turbo-generator set, which is due to arrive from Milwaukee in May. This will be the largest generator set of this type in Oregon.

The Crown Columbia Pulp & Paper Company is preparing to build a logging railroad between the Columbia River and its timber tract in Clatsop County, Ore., and it is reported that a new pulp mill will be installed the coming summer.

The Oregon-Washington Railroad & Navigation Company is preparing to erect a large shop building at Argo, Wash.

President J. T. Heffernan of the Heffernan Drydock Company, Seattle, Wash., left the first of the week for a visit to various shipbuilding plants on the Atlantic coast. While in the East he is expected to place orders for considerable new equipment, as a number of improvements to the Seattle plant have been planned for the coming spring.

H. R. Noack, president of Pierson, Roeding & Co., agents for several lines of electric and railroad machinery, is making a tour of the north coast.

The Alaska Hydraulic Motor Company has been incorporated at Tacoma, Wash., with a capital stock of \$100,000, by T. F. Palms, D. T. Peck and others.

A. K. McAlpin, Rosalia, Wash., plans to start a small machine shop at Grangeville, Idaho.

Bids have been received from Seattle firms for repairs on the army transport Dix, which will cost about \$10,000.

Contracts have been let for a large pumping plant, operated by electricity, for the Gem Irrigation District on the Snake River in Idaho.

The city of Astoria, Ore., is taking figures on the installation of a rock-crushing plant.

Texas

AUSTIN, TEXAS, January 13, 1912.

Machinery dealers have felt the effects of the almost unprecedented weather and are doing comparatively little in the matter of placing orders. While the cold weather is having a depressing influence upon trade it is expected that it will prove beneficial in the long run, inasmuch as it brought with it more snow than has been had in the northern and northwestern parts of the State for many years. Wonderful development of the shallow water belt of the State is promised for this year. The irrigation of the lands in this belt is obtained by the use of pumping plants. Many of these outfits have already been installed and orders have been placed for a large number of others.

M. A. Grant, of Houston, and associates are arranging to establish a plant at Cuero for the manufacture of mattresses.

The Clingman-Hall Machinery Company, of Plainview, will soon begin putting down a series of wells for irrigating an 18,000-acre tract of land near that place. In all about 25 wells will be dug and pumping plants installed upon each.

J. Walter Day will install a pumping plant upon an irrigating well which he will put down upon his farm near Plainview.

The Winters Light & Milling Company has been formed at Winters with a capital stock of \$10,000. The incorporators are J. L. Allred, A. F. Roberts and A. K. Doss.

It is announced by R. L. Hudgins, general manager of the Industrial Cotton Oil Company, Houston, that the company's plant which was destroyed by fire recently will be rebuilt at a cost of nearly \$1,000,000. The new plant will be larger than the one that was destroyed.

The National Oil Company has been formed at Ft. Worth with a capital stock of \$10,000. The incorporators are J. M. Ware, C. H. Bencini and Sam Davidson.

The Lone Star Pickle Company has been formed at San Antonio with a capital stock of \$22,000. It will manufacture and sell preserves, pickles and other products. The incorporators are A. J. Fitzpatrick, A. A. Gittinger, J. W. Faas and others.

The Big Springs Ice & Mfg. Company will install new machinery and double the capacity of its ice plant at Big Springs.

The Empire Gas & Development Company has been granted a franchise by the City Council of Cisco to lay a natural gas distributing system over the streets and to pipe the fuel into town.

O. M. Edwards will install an irrigation pumping plant upon his land near Pecos.

The Taylor Light & Heat Company is installing a gas plant at Taylor and laying a distributing system and pipes over town.

Machinery will soon be installed in the sewage disposal plant at El Paso. The city has just finished extending the sewer system 1500 ft.

The Sherman Ice Company is building an addition to its plant at Sherman at a cost of \$50,000.

The Crescent Pump Works has been formed at Ft. Worth with a capital stock of \$10,000. The incorporators are R. Vickery, W. W. Manning, C. E. Cranz and others.

George Herder, of Weimer, will enlarge and otherwise improve his waterworks plant at Eagle Lake.

W. E. Shell & Co. will install a waterworks plant and distributing system and an electric light plant at Port Lavaca. Considerable progress has already been made in the work.

The Parsley-Paine Mfg. Company will greatly enlarge its plant at Crockett for the manufacture of monkey wrenches and other articles.

It is announced that the Grand Falls Mutual Irrigation Corporation, which has a capital stock of \$650,000, has made financial arrangements for the construction of its irrigation canals and reservoirs upon its large tract of land near Grand Falls. It will reclaim about 20,000 acres of land.

The drainage commission for the Cameron County, Texas, Drainage District No. 1 has let the contract for the construction of a complete drainage system for the district to the International Drainage Company of Houston at a cost of \$204,500. The main canal will be about 24 miles long and it, together with its several laterals, will drain about 80,000 acres of land. Considerable machinery will be required for the work.

The Compania Minera Exploradora, 7 Explotadora of Guanacevi, State of Durango, Mexico, will install a gasoline hoisting plant upon its property.

W. C. Humphrey and associates will install a 50-ton cyanide plant upon their Gueriguita mine, 30 miles south of Nacozi, State of Sonora, Mexico.

J. P. Burford, of Hermosillo, Mexico, and associates will construct a large system of irrigation upon a big tract of land in the valley of the Yaqui River. They are also preparing to irrigate 23,000 acres of land near Hermosillo.

Juan T. Quechal, of Tlaxcala, Mexico, and associates have applied to the Federal Government for a loan of \$10,000,000 to be used in the purchase of land near that place and the construction of a system of irrigation. The water supply will be obtained from Salinapan and Atayac rivers.

Canada

TORONTO, ONT., January 13, 1912.

Manufacturers have no difficulty in finding business. There has been retardation of operations as a consequence of the severe weather, but no shortage of work. Intense cold and some rough weather have affected train service, and the means of handling traffic at terminal points have been found inadequate in some cases. The cold has also caused interruptions in some factories using hydroelectric power. But the demand for machinery and equipment keeps up. Some of the principal banks have held their annual meetings since the beginning of the year. The addresses of presidents and general managers are cheering in their reference to current commercial and industrial conditions and as to the outlook. Bankers who are most noted for caution and for

emphasizing the risks of expansion are quite optimistic and sanguine as to the prospects. The only clouds they see are those hovering over the real estate market, there being too much speculation therein.

The Dome Mining Company, Porcupine, Ont., will install another compressor with a capacity of 12 drills.

Hull, Ont., has landed another important industry in a \$1,000,000 cement company, which is to locate near the Fleming-Dupuis Supply Company's quarry. The new company, which is mostly composed of Montreal and Toronto men, will also include H. Dupuis, of Hull.

The Ontario Canners' plant at Sarnia, Ont., is to have new machinery installed this year.

The Brown-Boggs Company, Hamilton, Ont., is contemplating the enlargement of its plant. Its capital stock is to be increased to \$500,000, and more attention is to be paid to the manufacture of tools and machinery.

The Cockshutt Plow Company, Brantford, Ont., has acquired the Adams Wagon Company and the Brantford Carriage Company, and will make an extensive addition to its plant.

Notice appears in the Canada Gazette that the capital stock of the Canadian end of the Oliver Chilled Plow Company, Hamilton, Ont., is to be increased from \$1,000,000 to \$2,500,000.

The City Commissioners of London, Ont., are considering development and purchase of necessary electrical equipment early in the year in connection with Springbank dam.

The output of Joggins Mines will be doubled, necessitating installation of electric power plant at Chignecto, N. S., by the Maritime Coal, Railway & Water Power Company.

The Imperial Wire & Cable Company has purchased several acres of land at Highlands, near Lachine, Que., as a building site for a new factory.

The ratepayers of Owen Sound, Ont., have approved the by-law to loan \$20,000 to the Bolt & Nut Company.

The Canadian Wolverine Company, Ltd., Chatham, Ont., is inquiring for a 154-hp. gas engine and generator for its new addition now in course of erection.

The Elliott Soap Works, Galt, Ont., will erect a two-story factory, 50 x 100 ft., with wing 30 x 50 ft., of brick and concrete on East River road.

The Sarnia Fence Company, Sarnia, Ont., has been incorporated with a capital stock of \$500,000 to manufacture wire fencing. The directors are John R. Pierdon, Clarence P. Smith and Charles Bolton.

An industrial merger has been completed at Welland, Ont., whereby the James Smart Mfg. Company, Brockville; Canadian Billings & Spencer, Ltd., Welland, manufacturer of drop forgings and machinists' tools, and the Canadian Forge Works, Welland, become one company. J. Gill Gardner, Welland, will be general manager.

The Tuttle-Bailey Mfg. Company has purchased a five-acre site at Welland, Ont., and will erect a foundry in the spring for the manufacture of ferro-steel registers.

Manufacturing operations have been commenced in the new plant of the Page-Hersey Iron Tube & Lead Works, at Welland, Ont., recently completed at a cost of about \$1,000,000.

It is now stated that the Canadian Pacific Railway shops at Calgary, Alberta, will consist of 20 buildings and give employment to 5000 men, not 2500 men as previously announced. The locomotive shop alone is to cover 6 acres, the machinery to be of the latest design and the tool equipment very complete.

The City Engineer of Edmonton, Alberta, calls for the spending of \$30,000 on sewage disposal plant.

The Dominion Bridge Company's proposed plant at Calgary, Alberta, will employ about 1200 hands.

There are expectations in Port Arthur, Ont., that the Canada Car & Foundry Company will establish works there.

The Portland Cement Contraction Company has commenced operations on the erection of a \$1,000,000 plant at Todd Inlet, Vancouver Island. This is within a few miles of the Vancouver Island Portland Cement Company's plant, established several years ago.

Tudhope, Anderson & Co., Ltd., Winnipeg, are planning a warehouse at Edmonton, Alberta, for the manufacture of carriages and agricultural implements, 50 x 150, to cost \$35,000. Construction to start in spring.

The new sawmill of the B. C. Lumber Company, now in course of erection on Lulu Island, will, it is stated, cost in the neighborhood of \$500,000. The present headquarters is on Coal Harbor, Vancouver.

Tenders are called until January 22 for supply of one 250-kw. exciter motor generator set with accessories complete; also additional parts to be erected on foundations supplied by the corporation in power house at Point du Bois. Secretary Board of Control, M. Peterson, Winnipeg.

Government Purchases

WASHINGTON, D. C., January 15, 1912.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids January 23, under schedule 4224, for one stationary head drill, one upright drill, one turret lathe, one cutting machine, one milling machine and one crank shaper, all for delivery to Boston, Mass.

The Paymaster General, Navy Department, Washington, will open bids January 23, under schedule 4197, for furnishing one refrigerating plant at Mare Island, Cal.

The Paymaster-General, Navy Department, Washington, will open bids February 6, under schedule 4223, class 1, for one double-disk grinder.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids January 30 for four 300-kw generating sets for Brooklyn, schedule 4249, and one steam and hand-steering engine for delivery to Mare Island, Cal., under schedule 4251.

The Mississippi River Commission, United States Engineer's Office, Memphis, Tenn., will open bids February 8 for furnishing one locomotive crane.

The Isthmian Canal Commission, Washington, will open bids January 22 under canal circular 672 for one centrifugal sump pump direct connected to induction motor and mounted on truck, together with necessary fittings.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids January 9 for material and supplies for the navy yards as follows:

Schedule 4185, class 34, one bevel band saw for delivery to Philadelphia—Bidder 36, Frevert Machinery Company, New York, \$368; 37, J. A. Fay & Egan Company, Cincinnati, Ohio, \$1709.50; 57, Kemp Machinery Company, Baltimore, Md., \$1295.76, L. Power & Co., Philadelphia, Pa., \$2450; 117, American Wood Working Machinery Company, Rochester, N. Y., \$1100.

Class 35, one automatic horizontal hollow chisel mortiser—Bidder 12, Bentel & Margedant Company, Hamilton, Ohio, \$675; 37, J. A. Fay & Egan Company, Cincinnati, Ohio, \$687.75; 42, Greenlee Bros. & Co., Rockford, Ill., \$634.50; 62, Manning, Maxwell & Moore, New York, \$645.60, \$638.10 and \$720.60; 117, American Wood Working Machinery Company, Rochester, N. Y., \$769.

The supervising architect, Treasury Department, Washington, opened bids December 27, 1911, for the installation of heating and ventilating apparatus in the United States Federal buildings, San Diego, Cal., as follows:

Pacific Fire Extinguisher Company, San Francisco, Cal., \$10,655; C. H. Julian, San Diego, Cal., \$15,426; Machinery & Electrical Company, Los Angeles, Cal., \$14,626.

The Isthmian Canal Commission, Washington, opened bids December 26, 1911, under canal circular 668, as follows:

Class 1, one motor-driven air compressor—Bidder 3, American Compressor & Pump Company, Baltimore, Md., \$1,245; 5, The Blaisdell Machinery Company, Bradford, Pa., \$1,015; 6, Blake & Knowles Steam Pump Works, New York, \$1,222 and \$1,265; 11, Chicago Pneumatic Tool Company, New York, \$1,077 and \$1,331; 22, Fox Brothers & Co., New York, \$1,291.44; 32, Ingersoll-Rand Company, New York, \$1,265; 54, Norwalk Iron Works Company, South Norwalk, Conn., \$1,890; 71, Westinghouse Air Brake Company, Pittsburgh, Pa., \$1,825.

The Bureau of Supplies & Accounts, Navy Department, Washington, opened bids December 26, 1911, for material and supplies for the navy yards as follows:

Schedule 4144, class 71, four multicoil navy type evaporators and two multi coil navy type distillers for delivery to Brooklyn—Bidder 96, Griscom-Spencer Company, New York, \$12,550; 269, Sanitary Water Still Company, Jamaica, N. Y., \$6,282.

Schedule 4145 class 72, one automatic screw machine for delivery to Portsmouth—Bidder 40, Brown & Sharpe Mfg. Company, Providence, R. I., \$1,478.75 and \$1,598.75.

The Palmetto Metal Company, Chicago, Ill., manufacturer of railroad and mill babbitt under the brand Palmetto, has recently been reorganized. The reorganization has brought to this old and favorably known company largely increased manufacturing facilities, together with ample working capital, and the company is now in a position to vigorously extend its operations. The company's affairs are still in the hands of those responsible for the reputation and integrity of its product.

New Tools and Appliances

This is essentially a news department for which information is invited.

Tap and Reamer Wrench.—Eliminating the possibility of the tap and reamer corners wearing off in use was one of the special points considered by W. A. Peck, 141 Brewery street, New Haven, Conn., in designing a new type of tap and reamer wrench. This tool is made of steel in several sizes and the line of applied leverage is directly in line with the center of the reamer or tap, an arrangement which is said to reduce the chances of breakage.

Cold Saw.—For cutting I-beams and other structural material having a maximum width of 20 in. and a height of 7 in., the Higley Machine Company, Croton Falls, N. Y., is manufacturing a new design of cold saw. This tool differs from the ones previously built by this company in having the 28-in. blade cut from above instead of below. In this way, it is emphasized, it is easier to set the work in line with the saw according to marks made on the upper surface. Another special feature of this machine is the giving of a lateral movement of 3 in. to the table so that the work may be clamped approximately in line with the saw blade and then brought into exact alignment by using the cross feed screws of the table which are operated by a crank. The cutting speed of the saw is 32 ft. per minute and the drive is the builder's well-known toothed wheel method, the wheel meshing with holes in the saw. This wheel is driven by a 5-hp. motor through bevel gears. Three feed changes, $\frac{1}{2}$, 1 and $1\frac{1}{2}$ in. per minute, are obtainable and are controlled by shifting the belt on a three-step cone pulley. A circular rack on a saw frame which receives its motion from a pinion driven through a special transmission device feeds the blade into the work. The design of the feed mechanism is such that, if the saw should catch, the friction disk which transmits power by making contact with the cone pulley will slip and stop the feed, thus avoiding breakage of the saw. The amount of power required to cause this friction to slip can be increased or decreased at will by varying the tension of a heavy coil spring. The saw frame is counterbalanced and a chain-driven pump supplies lubricant to the saw from a tank in the base.

Punch Press Safeguard.—The H. & A. Lock Company, 156 Fifty-third street, Brooklyn, N. Y., is manufacturing an automatic guard to prevent operators of punch presses from having their fingers caught between the punches and the dies. It is operated by the regular pedal trip and the clutch controlling the movement of the press cannot be thrown into engagement until the guard is raised to an almost vertical position. The special features of the guard are simplicity, effectiveness and a wide range of application. When it is not in use the guard lies perfectly flat on a level with the top of the die and does not interfere with the handling of the work. As the foot pedal is depressed the guard rises gradually and assumes a vertical position. At this instant the clutch acts and the press is tripped, it being impossible to trip the press when the guard is down. The guard is so made that it can be adjusted to any width or height of die and the shape can be of any desired form. In attaching the guard to a press it is only necessary to drill two holes in the bolster or bed plate and attach but one lever, a bell crank to the regular tripping mechanism.

Motor-Driven Breast Drills.—A motor-driven breast drill which can be run with either direct or alternating current is being manufactured by the Temco Electric Motor Company, Leipsic, Ohio. The tool can be reversed, which is a handy feature for tapping, and another special point is the spindle lock. This consists of a break-over movement to the spindle, which brings this part into the locking position, where it is kept from turning by jaws on the main frame. In this way a chuck can be tightened either by hand or a spanner wrench. The maximum size of drill handled is $\frac{3}{8}$ in.

Compound Bench Lathe Slide Rest.—The Stark Tool Company, Waltham, Mass., has recently brought out a new compound slide rest for bench lathes, equipped with micrometer set stops on each of the feed screws. This arrangement makes it possible to obtain very close adjustments, and the swivel is graduated in degrees and

turns on a bevel. Either round or square turning or boring tools can be mounted in the tool post, the former being clamped between two rockers and the latter being held in an eccentric quill, which enables the tool to be adjusted when it is to be set to the center of the work. If desired the rest can also be supplied with a plain tool post.

Revolving Head Screwdriver.—A recent product of W. A. Peck, 141 Brewery street, New Haven, Conn., is a revolving head screw driver. When in use the head rests in the hollow of the hand, while the driver is twirled between the index finger and the thumb. The tool is polished and nickel plated and the blade, which is reversible, is made of drill rod steel. The tool is said to be very handy and rapid in assembling and disassembling light work, while the hexagon head prevents it from rolling when it is laid down.

Rectigraph.—An automatic photographing machine for copying or reproducing blue prints and written, printed or typewritten matter has been recently developed by the Rectigraph Company, Rochester, N. Y. Although the complete process of photography is embodied in the machine itself, no plates or films are necessary. The copy is made directly from the subject on sensitized paper, the parts which are light in the subject being dark in the reproduction and vice versa. If it is desired to produce a copy having the same colors as the original, the first copy is used as the subject. The copy is placed in the copy holder and the image brought to the correct focus on the ground glass, which is then lifted out and the magazine which forms the rear of the machine is connected to the back of the camera member. The magazine contains a 500-ft. roll of sensitized paper which is put up in much the same way as film cartridges used in small hand cameras, and these rolls can be placed in the machine in daylight. The paper is brought into position for an exposure by turning a crank, and the exposure is made by pressing a bulb. After the exposure the paper is cut off and carried to the developing tank, and from there to the fixing tank. This process is continuous, the turning of the crank causing the paper or prints to be moved along. After each operation the crank is automatically locked to prevent accidental operation.

Tool Holder.—B. Morgan, Newport, R. I., has recently brought out a tool holder which is designed to accommodate various shapes of tools such as round, flat, square, hexagonal and other ones in a wide range of sizes. The holder is made in two parts from hardened steel, both being accurately machine finished. The two parts are held together by a slotted link which keeps them parallel as far as side motion is concerned, but permits them to swing around in a straight line and reverse their position. The heavier portion of the holder has a V slot on one side and a hairline slot on the other, while the lighter bar has a V slot on one face, while the other is perfectly plain. The slots in the two portions register, thus enabling large tools to be held, while when the position of the parts is reversed the small or hairline slot has the plain bar opposite, thus enabling the holder to clamp the lightest tools.

Horizontal Broacher.—A new type of horizontal broacher has been recently brought out by J. N. Lapointe Company, Marlboro, Mass. A sliding head pulled by a 2½-in. screw and passing through the hub of the main gear, in which a special composition nut is inserted so that it can be easily removed for replacement, constitutes the pulling mechanism. A large ball thrust bearing is placed to receive the pressure when the load is applied, and this arrangement increases the pulling capacity of the machine. Two speed changes are available, the variation being secured by a sliding gear, which is directly connected to the driving gears. The driving mechanism is of a type similar to that of a planer having two loose and one tight pulleys. A large tube screwed on the rear of the machine into which the screw telescopes protects it from any dust accumulated by the belt. A special supporting table can be fastened by screws on the front end of the machine, two lugs having been provided for the purpose. The equipment of the machine includes an automatic oil pump for flooding the work when it is being broached and a counter-shaft.

The Keystone Tube Works, Inc., Connellsville, Pa., has increased its capital stock from \$200,000 to \$300,000.

The Phillips Sheet & Tin Plate Company

The Phillips Sheet & Tin Plate Company, whose general offices are at Weirton, W. Va., now has three separate and distinct tin plate plants. These are located at Clarksburg and Weirton, W. Va., and Steubenville, Ohio. At Clarksburg are 12 hot tin mills, the plant being strictly modern in every way, having been rebuilt in 1908, and has a capacity of 1,000,000 boxes of coated plate per annum. At Steubenville are also 12 hot tin mills, of strictly modern design in every way, and with a capacity of 1,000,000 boxes per annum of bright plate. At Weirton are 20 hot tin and sheet mills, this plant having been completed only six months ago, and has a capacity of 120,000 gross tons of material per annum. All this output can be coated if desired, as the finishing capacity of the Weirton plant was built sufficiently large to take care of the mill output. A large portion of the product consists of sheets, enameling stock, galvanizing material, blued iron, and specially finished black plate; in addition, the Weirton plant makes roofing plate of all kinds, charcoal tin plate and a large tonnage of standard coke plate.

The Phillips Sheet & Tin Plate Company maintains offices in New York, Philadelphia, St. Louis, Chicago, Pittsburgh, Vancouver, B. C.; Seattle, Wash.; Portland, Ore., and San Francisco. E. T. Weir is president; D. M. Weir, vice-president and secretary; W. H. Baldridge, vice-president, in charge of New York sales; F. S. Loeb treasurer, and J. F. Lloyd, assistant secretary.

Rainey Coke Works Improvements

The Erie City Iron Works, Erie, Pa., through its representative, T. H. McGraw, Jr., is just completing important power plant improvements for W. J. Rainey, Uniontown, Pa., the well-known coke operator. At the Revere works a new 250-kw. Erie City Lentz engine, of the poppet valve type, direct connected to a General Electric generator, has been installed. At the Royal works two 300-hp. Erie City vertical water tube boilers and one Erie City Lentz engine, of the poppet valve type, direct connected to a 250-kw. General Electric generator, have been added. At the Mt. Braddock works three 300-hp. Erie City vertical water-tube boilers, with a large self-supporting stack, 84 in. in diameter and 175 ft. high, have been installed, also an Ingersoll-Rand latest design air compressor. At the Allison works, where Mr. Rainey three years ago installed four Erie City 300-hp. vertical water-tube boilers, an additional power plant has been built near Merrittstown, consisting of five 300-hp. Erie City vertical water-tube boilers, a self-supporting stack, 84 in. x 175 ft., and one Erie City Lentz poppet valve steam engine, direct connected to a 250-kw. General Electric generator. These improvements place the power plants at the various Rainey coke works in splendid physical condition.

Condensite.—A new material bearing the name of Condensite has been recently placed on the market by the Condensite Company of America, Glen Ridge, N. J. In solution it can be used for technical purposes such as an air drying varnish, as an oven drying enamel or as a cement, and it can be made either transparent or translucent and in a variety of colors. It can be employed for impregnating electrical apparatus or wood or other fibrous or cellular substances and can be used for molding. For the last purpose it can be supplied either as a fine powder to be used in cold molds or as a cold plastic which can be formed in different shapes preparatory to molding and can be used in either open or closed molds. In its simplest form this substance is gum-like, transparent, hard and fusible at moderate temperatures and does not harden under the action of heat and is soluble in the customary solvents. When subjected to further mechanical treatment, and upon being heated, it becomes hard and strong, infusible, insolvent and a good insulator.

The Anderson Engine Company, whose factory is at Shelbyville, Ill., has established its main office at 160 N. Fifth avenue, Chicago. All correspondence will be taken care of at the Chicago office and a few sample gas and gasoline engines will also be carried there, but all shipments will be made as heretofore from the factory.

Current Metal Prices.

The following quotations are for small lots. New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly report.

**IRON AND STEEL—
Bar Iron from Store—**

Refined Iron:	
1 to 1½ in. round and square	1 lb. 1.70¢
1½ to 4 in. x ½ to 1 in.	1 lb. 1.80¢
1½ to 4 in. x ¼ to 5 in.	1 lb. 1.80¢
Rods—½ and 1½-16 round and square.	1 lb. 1.80¢
Angles:	Cts. 1 lb.
3 in. x ½ in. and larger.	1.80¢
3 in. x 3-16 in. and ¾ in.	2.20¢
1½ to 2½ in. x ¼ in.	1.95¢
1½ to 2½ in. x 3-16 in. and thicker.	1.95¢
1 to 1½ in. x 3-16 in.	1.95¢
1 to 1½ in. x ½ in.	2.00¢
¾ x ½ in.	2.10¢
¾ x ¾ in.	2.15¢
¾ in. x ½ in.	3.35¢
¾ x 3-32 in.	4.40¢
Tees:	
1 in.	2.25¢
1½ in.	2.10¢
1½ to 2½ x ½ in.	1.90¢
1½ to 2½ x 3-16 in.	2.00¢
3 in. and larger.	1.85¢
Beams:	1.80¢
Channels, 3 in. and larger.	1.80¢
Bands—1½ to 6 x 6-16 to No. 8.	2.00¢
Burden's "H. B. & S." Iron, base price.	2.95¢
"Burden's Best" Iron, base price.	3.15¢
Norway Bars	3.00¢

Merchant Steel from Store—

Bessemer Machinery	
Toe Calk, Tire and Sleigh Shoe.	25¢ @ \$3.00¢
Best Cast Steel, base price in small lots.	7¢
Sheets from Store—	
Black	
One Pass, C.R. R.G.	
Soft Steel. Cleaned	
No. 16	1 lb. 2.40¢
Nos. 18 to 20.	2.45¢
Nos. 22 and 24.	2.50¢
No. 26	2.55¢
No. 28	2.65¢
Russia, Planished, &c.	
Genuine Russia, according to assort-	
ment	1 lb. 12 @ 14½
Patent Planished. W. Dewees	
Wood	1 lb. A. 10¢; B. 9¢ net
Galvanized	
Nos. 12 and 14.	1 lb. 2.75¢
No. 24	3.10¢
No. 26	3.30¢
No. 28	3.60¢
No. 20 and lighter 36 inches wide.	25¢ higher.

**Genuine Iron Sheets—
Galvanized**

Nos. 22 and 24.	1 lb. 5.50¢
No. 26	6.00¢
No. 28	7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted. Galvd.
No. 24	100 sq. ft. \$8.75
No. 26	100 sq. ft. 2.85
No. 28	100 sq. ft. 2.50

Tin Plates—
American Charcoal Plates (Per Box)

AAA Charcoal:	
IC. 14 x 20.	\$6.35
IX. 14 x 20.	7.60
A Charcoal:	
IC. 14 x 20.	\$6.30
IX. 14 x 20.	5.40

American Coke Plates—Bessemer—

IC. 14 x 20.	107 lb.
IX. 14 x 20.	5.20

American Terne Plates—

IC. 20 x 28 with an 8 lb coating.	\$8.10
IX. 20 x 28 with an 8 lb coating.	10.10

Seamless Brass Tubes—

List November 13, 1908.....Base price, 18¢

Brass Tube—Iron Pipe Sizes—

List November 13, 1908.....Base price, 18¢

Copper Tubes—

List November 13, 1908.....Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 20% 1 lb.

High Brass Rods—

List February 1, 1911. 15% 1 lb.

Roll and Sheet Brass—

List February 1, 1911. 16¢ 1 lb.

Brass Wire—

List February 1, 1911. 15% 1 lb.

Copper Wire—

Base Price, Carload lots mill 15%¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) 1 lb. 19¢

Sheet Copper Cold Rolled, 16 1 lb. advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 16 1 lb. square foot.

Sheet Copper Polished over 20 in. wide, 2¢ 1 lb. square foot.

Planished Copper, 1¢ 1 lb. square foot more than Polished.

Tinning, one side, 3½¢ 1 lb. square foot.

METALS—
Tin—

Straits Pig	1 lb. 47¢ @ 48¢
Copper—	

Lake Ingots	1 lb. 15½ @ 16½¢
Electrolytic	1 lb. 15½ @ 15½¢
Casting	1 lb. 15 @ 15½¢

Spelter—

Western	1 lb. 7½ @ 7½¢
Zinc—	

No. 9, base, cans.	1 lb. 8½¢. Open, 1 lb. 9½¢
Lead—	

American Pig	1 lb. 5½ @ 5½¢
Bar	1 lb. 7 @ 7½¢

Solder—

16 & ½ guaranteed	1 lb. 26½ @ 27½¢
No. 1	1 lb. 24½ @ 25¢
Refined	1 lb. 23 @ 23½¢

Prices of Solder Indicated by private brand vary according to composition.

Antimony—

Cookson	1 lb. @ 10½¢
Hallets	10@ 8½¢
Other Brands	9@ 8½¢

Bismuth—

Per lb.	\$2.00 @ \$2.25
Aluminum—	

No. 1 Aluminum (guaranteed over 90% pure), in ingots for remelting (ton lots)	20 to 21¢
Rods & Wire	Base Price 31¢

Sheets	Base Price 33¢
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Old Metals—
Dealers' Purchasing Prices Paid in New York.

Copper, heavy and crucible.	12.25
Copper, heavy and wire.	12.00
Copper, light and bottoms.	11.00
Brass, heavy.	8.50
Brass, light.	6.50
Heavy machine composition.	10.50
Clean brass turnings.	8.00
Composition turnings.	9.00
Lead, heavy.	4.00
Lead, tea.	3.75
Zinc, scrap.	4.75



It has seemed to some men that the files used in their shops were of little productive importance, but

NICHOLSON FILES

have proved the difference between file efficiency and inefficiency.

Stroke for stroke they cut faster and cleaner than any others. File for file they last longer in a condition fit for hard service.

NICHOLSON FILES rise to the emergencies of modern usage. They are made in more than 3500 styles—a kind for every need.

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Providence, Rhode Island, U. S. A.

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